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XXX.—*On the Relation of the Domesticated Animals to Civilization.* By JOHN CRAWFURD, Esq.

MAN, I may premise, is himself a domesticated animal, for even in the rudest condition in which he has ever been seen he has already made artificial acquirements—learnt to fashion a club, a spear, a fish-hook, a flint-knife,—to clothe himself in the skins of wild beasts, to kindle a fire, and, like the domestic animals, as distinguished from the wild, to have assumed, within each original race, a great variety of physical form. In the condition thus described, he must ever have continued had he not subdued the domestic animals to furnish him with food, labour, and clothing. Civilization may, indeed, be said to be ever in proportion to the number and variety of the animals which man has subdued to his service. They would be reckoned as inventive geniuses of the first order in their tribes, who tamed the first dogs, the first hogs, the first sheep, the first oxen, horses, and camels, and brought them to multiply in servitude.

Without the possession of some of the domesticated animals, man must for ever have continued a precarious savage; and without the help of one or more of the more powerful of them, no considerable progress in civilization could have been attained. The indispensable conditions of quality of race and locality being equally favourable, the amount of social progress may indeed be measured by the number and quality of the animals reduced to servitude. Utter savages possess none at all; and from these we rise, by successive degrees, to the more advanced nations of modern Europe, in possession of all of them that would appear amenable to domestication, or that are worth the trouble of domesticating.

A rapid survey of man in his various stages of progress will easily satisfy us of the truth of the proposition thus stated. In the continent of Australia, inhabited by one of the lowest races of man, there existed but a single animal amenable to domestication—the dog, and he in a temperate climate without frost or snow, of no service but to assist in the chase. In a position so adverse, the Australians were, of course, savages, distinguishable only from other predaceous animals by superiority of intellect. Had they even been of the highest of the races of man, instead of being among the very lowest, they must still have remained savages, unless strangers had brought to them some of the more useful of the domesticated animals—an event which in the thousands of years' existence of the Australians, never took place.

The Andaman Islands, inhabited by a race of men, if possible lower than the Australians, do not possess any animal at all amenable to domestication, and the condition of man here was found even more grovelling than in Australia.

Divided from Australia by a strait of no great breadth, is the large island of New Guinea, inhabited by a different race of man—oriental Negroes. Some tribes of these are found in possession of the dog, the domestic hog, and common fowl, and in civilization these are considerably in advance of the Australians. At no great distance from the Andamans are the Nicobar Islands, inhabited by a Malayan race, in possession of the dog, the hog, and common fowl, but of none of the larger animals, yet, compared with the Andaman Islanders and Australians, they are a civilized people.

Of the brown-complexioned inhabitants of the islands of the Pacific Ocean, as distinguished from the Negro, such of them as were found in possession of the dog, the hog, and common fowl, had attained a considerable measure of civilization, while those that wanted them were arrant savages, and often man-eaters. The people of the Society and Friendly Islands were of the first of these classes, and those of New Zealand of the latter. Had the New Zealanders possessed the ox in addition to the dog, with the help of a wide and fertile territory and a bracing climate, they would probably not only have far surpassed the cognate tribes within the tropics, but have become a nation more civilized and powerful than Mexicans and Peruvians, whose sole beast of burden was the feeble llama, without any beast of draught at all. Besides the dog, of small utility to them when there was no game to hunt, the New Zealanders had but a single quadruped, a species of rat, and this so rare and highly prized, that the chiefs had a game-law for its preservation from ignoble poachers, the penalty for the infraction of which was, to be eaten—the absence of animal food having probably contributed to make the omnivorous creature, man, in this instance among the most determined of cannibals.

If we survey the state of society in the great Malay and Philippine archipelagos, we shall find abundant illustrations of the proposition which I have stated. The aboriginal inhabitants of the huge, but not fertile island of Borneo, are in possession of the dog, the hog, and common fowl, but of no animal fit for labour. They are throughout in a very rude state of society, yet never cannibals. The domestic animals they possess, it will be observed, are the very same with those possessed by the islanders of the Pacific; but they have attained a somewhat higher civilization, owing to their possession of corn, cotton, and malleable iron, which we ascertain by the evidence of language that they received from strangers, an advantage denied to the islanders of the Pacific by remoteness and isolation.

The people of the neighbouring islands of Java, Sumatra, and

Celebes, of the same race of man with the aborigenes of Borneo, have been immemorially in possession of all the domesticated animals suited to their soil and climate, and are a civilized people, with a knowledge of letters of their own invention.

The inhabitants of the Molucca islands, also of the Malayan race, were not found in possession of any domestic animal fit for labour, and were, consequently, in a much lower social condition than the people of the great islands just mentioned. Their fine spices (a peculiar possession) were no compensation for the absence of corn and cattle. They were ignorant of letters, and their iron and cotton clothing they received from strangers in barter for their spiceries.

The principal islands of the Philippine group are equal in fertility to Java, and superior to Sumatra and Celebes, and the inhabitants of the same race as theirs; but when discovered, they were far below them in civilization, as implied by the inferiority of their arts, and the imperfection of their indigenous letters. Strangers, indeed, had introduced among them the smaller domesticated animals, with cotton, corn, and iron, but no animal adapted for labour; and it remained for Europeans to make them acquainted with the ox, the buffalo, and the horse, by help of which they are now, although ruled by a stranger race, known to have attained to a higher civilization than Malays or Javanese, who were so greatly their superiors three centuries ago, and from whom, indeed, as is testified by language, they had borrowed some of their early improvements.

Over the vast continent of America, inhabited, with one small partial exception, by the same race of man, there existed but four animals amenable to domestication, or at all events which had been domesticated, any one of the three largest of which hardly equalling in strength a single ox. The nations, however, which possessed these feeble assistants were the only ones which had made any progress towards civilization. That progress, however, was not large, for no American nation had discovered malleable iron or invented letters. Most of the tribes of America were without any domesticated animal at all; and were less or more barbarous only in proportion as their waters and forests were better or worse stocked with fish and game.

There are regions of the earth, however, where, from severity of climate, the more important of the domestic animals cannot live—where man is restricted to the services of one or two of the inferior ones, and where, consequently, nature itself would seem to render any considerable advance in civilization impossible. Thus the Laplanders have only the dog and the reindeer, and the Esquimaux the dog alone. In these instances, the race of man itself would seem to have been formed for the climate in which its lot is cast.

There are, however, other regions in which most of the domesticated animals thrive sufficiently well, but where a large advance in civilization would seem precluded by the character of a physical geography, which forces the races inhabiting them into pastoral and nomadic habits. This has been immemorially the case with the vast region popularly known to us as Tartary, with parts of Arabia, and other portions of Central Asia, the races inhabiting which, although possessed of the ox, the horse, the ass, the sheep, and the goat, have never emerged from the shepherd state, or, at all events, not until they had migrated into more auspicious regions. Thus, it was only after quitting their native soil, that the Arabs and Turks attained that moderate amount of civilization which they reached.

Dense woods and extensive marshes would, no doubt, in the early state of society, prove obstacles to advancement similar to those of steppes and deserts, yet more surmountable. The existence of these was most probably the main cause of the slow progress of the inhabitants of such countries as Germany, Gaul, and Britain, compared with that of the people of such open countries as Italy, Greece, Egypt, Upper India, Assyria, and Central China, for the first equally with the last were in possession of the domestic animals, conducive to an effective civilization, although, most probably, not at so early a period.

Before describing the domesticated animals in detail, I shall here offer a few general observations on the whole class. To begin, it must, I think, strike the most careless observer that, compared with the multitude of wild animals, the actual number reduced to servitude by man is exceedingly small, distinguishing domestication from mere taming, of which last many animals are capable. For example, out of not fewer than ten species of the bovine family, not above one-half have been found capable of domestication. The bison of America, the musk ox, the ox of Equatorial Africa, and the ox of South Africa, seem all incapable of domestication. Of the equine family, six in number, two only have been domesticated. The zebra in captivity seems as docile as the ass, but all efforts to domesticate it have proved decided failures. The hogs amount to twelve species, but of these one only has been domesticated. Of the numerous canine family, the dog alone has been domesticated, the fox, the jackall, the wolf, and the hyena being no more amenable to domestication than lions, tigers, or leopards. Of numberless deer, one alone, the reindeer, has been found capable of domestication. The sheep and goat are the only animals that have been domesticated out of the almost countless family to which they belong. Out of many rodents, the rabbit alone has been domesticated, and, of the numerous and varied feline race, the house cat, of which we know not the origin, is the only domesticated individual.

It is the same with birds. Of the gallinaceous family, four only have been domesticated, the common fowl, the gallini, the turkey, and the peacock. Of almost countless pigeons, we have domesticated one species only, the blue-rock pigeon; of geese, not, at the utmost, above four; and of the numerous ducks, probably not more than three or four species.

Another remark which deserves to be mentioned is this, that no record of the first domestication of any beast or fowl exists. All that we possess were, therefore, reduced to servitude in rude and remote times, beyond the reach of history or tradition. Not one has been added to the list by civilized man, and it would seem as if the entire number amenable to domestication had already been exhausted by savages or barbarians. Thus, for example, we have been acquainted with the animals of the New World for above three centuries and a half, and have, in this long time, not added a single animal to those which we found domesticated by its native inhabitants.

The variety produced by domestication is a subject deserving of special notice. This, although it certainly arises in some cases from the union of two or more closely-allied species, seems generally to vary with the different species. In the ox, the horse, the dog, the goat, the variety is very great, in form, in size, and in colour. It is comparatively small in the sheep and the ass, very small in the buffalo, and scarcely at all in the elephant and the camel. The rule obtains equally with birds. In the domestic fowl and duck the variety is very great; still greater in the pigeon: it is small in the goose, in the turkey, and the peafowl; while there is none at all in the gallini.

In some of these cases, however, as in those of the dog, the ox, and the horse, the great probability is, that some of the existing breeds are but mongrels, arising from the commixture of several distinct original but closely-allied species, capable of producing a fertile offspring. This class of animals has been found in the domestic or semi-domestic state, and, in one or two instances, even in a really wild one, in almost every country in the world, some of them so remote from each other, that, in a rude state of society, they could not have been conveyed by any means short of a miracle. Thus, dogs were found in South America, in some of the islands of the South Sea, and in Australia. In the canine family, the union of all the nearly allied species produces a fertile offspring. The *Banteng* of Java, or Bos Sondaicus, gives a prolific race with the common cattle of the island, and the Gayal of Bengal with the common zebu. Even when the species would appear remote, a fertile offspring is the result of their union. Thus, the union of the shaggy Yak of Tibet with the Indian cattle of the plains is followed by a prolific offspring. It is only when the species are very remote, as in the case of the horse and ass, that the result of their union is a sterile hybrid. The wolf and dog are not so remote but that their offspring is fertile. The llama, the alpaca, and vecuña of South America intermix readily to the production of fertile breeds.

It is to be observed, however, that in the state of nature the union of species, however closely allied, never takes place, so that there is no risk of confusion. It happens only under the constraint imposed by man, for in the free state there seems to be an instinctive repugnance to it. It is the same, indeed, with the different races of man himself, for between them no intermixture takes place, except under the constraint imposed by some form or another of subjugation. The Negro race does not intermix with the brown lank-haired race of the Pacific Islands; nor do the Hottentots with the Caffres of South Africa, although neighbours. Even in the most nearly allied races, as those of Europe, differences of language, manners, and religious opinions tend to keep them much apart.

The first reclaiming of our domesticated animals extends far beyond the records of history. We know not when or how they were first brought under the dominion of man. It is, indeed, as already stated, remarkable that within the historic period not one new species has been domesticated. On Egyptian monuments, computed to be 4,000 years old, we have representations of dogs, oxen, horses, asses, and sheep, known by the variety of their colours, forms, and employments, to be domesticated, and not differing, indeed, from the same animals of the same country at the present day. The Egyptians, then, had all these animals in a state of domestication forty centuries ago, and may have had them for an equal length of time before, for aught we know to the contrary.

With respect to the origin of the domesticated animals, some of them can no longer be traced to their wild originals, while others can clearly be so. The horse, the sheep, the camel, and the cat are not traceable to their wild state; but the dog, the ox, the goat, the ass, the llama, alpaca, and vecuña, the rabbit, the goat, with all our domestic poultry, can be so. The difference in this case has probably arisen from the greater facility of capturing such as have ceased to exist in the wild state with the greater inducement to capture them from their superior utility. The horse, the camel, and the sheep are inhabitants of the open plains, in which they could be captured without difficulty, whereas the ox and elephant are denizens of the forest, and the ass and goat of the mountains, where it would be more difficult to take them. This view would seem to be corroborated by our still finding the prototypes of all our poultry in the wild state, their freedom being evidently owing to their capacity of escaping servitude by flight.

Another general remark which presents itself is, that, with one unimportant exception,—the cat, all the animals which man has succeeded in domesticating are gregarious, or of social habits, an observation which applies alike to birds as to mammals. All of them, too, belong to the most recent creations of organic life, and were, no doubt, called into existence, either immediately before, or cotemporaneously with man, himself an omnivorous animal that could not have existed in many localities without at least some of them.

The last observation I have to offer is, that the remoteness of the first domestication of animals must be considered as evidence also of the antiquity of man himself. The ox, the horse, and the ass are represented on Egyptian monuments computed to be forty ages old; and how many ages, then, must not have passed away before the naked savages of the valley of the Nile could have acquired the skill which enabled them to construct these huge monuments unaided as they were by any foreign assistance.

The skilful and happily directed investigations of the ethnologists of Denmark and Switzerland have recently thrown much light, not, indeed, on the first subjugation of the domestic animals, for that could not be hoped for, but on their early possession by the European races; and it will not be out of place to add a few remarks on their discoveries.

An examination of the peat-bogs, the rude tumuli, and the refuse shell-heaps of Denmark, shows that the remote forefathers of the civilized Danes were hunters and fishermen, ignorant of any other cutting instruments than those made of stone. In the rude monuments in question, abundant relics of wild birds and beasts were found; the last of these including the auroch, the urus, and the beaver, animals long ago extinct in Denmark. Of the common ox, the horse, the sheep, the goat, the domestic fowl, no trace existed; and the only animals which could be supposed to have existed in a domestic state, and of which the skeletons were discovered, were the dog and the rein-deer.

It was the descendants of the savages who left such rude records of their existence, that invaded, plundered, and for a time even ruled our own island, a thousand years ago. It follows that the creators of the shell-heaps must have made a vast progress before they could have constructed the fleets that transported armies across the German ocean for these invasions. They have made an equally great one since, for they are now on a level with the highest civilizations of Europe, and far above those of Asia, whose ancestors were clad in silks and muslins, and possessed of corn and the sugar-cane, while theirs were clothed in skins and feeding on cockles and oysters, or seal and whale blubber—when they could get them.

The forefathers of the Swiss, who for security from enemies and for the convenience of fishing dwelt like Malays in houses raised on piles, on the borders and within the waters of their lakes, although hunters and fishermen, like the early Danes, were considerably more advanced. By their skeletons they are identified with the present race of inhabitants. Their cutting implements were first of stone, then of bronze, and very recently—that is, some two thousand years ago—of iron. The presence of some charred corn shows that they had even made a beginning in agriculture; and, instead of the two domestic animals of the savages of Denmark, they had the dog, the hog, the horse, the sheep, and the goat, with two varieties of ox, all, probably from inadequate food, being of small size, like the sheep, horses, and horned cattle of the Shetlands.

With such aids to progress, the Swiss would necessarily make more rapid advances in civilization than the Danes. The descendants of the pile-builders must have made great progress in strength and numbers, when, some two thousand years ago, pressed for room at home, they issued in a body from their own country, and waged brave battle with Roman legions .At that moment, they were a more civilized and powerful people than were the Danes when they invaded Britain, a thousand years later ; for they had corn to feed and cattle to transport a vast multitude, while the Danes were but scantily supplied with both, and would have been immovable but for their rude shipping.

The uses to which man has put the domesticated animals are very various, but may all be ranked under the heads of food, labour, clothing, and some miscellaneous economic purposes. For food the more civilized nations of Europe confine themselves to the flesh of the ox, the sheep, the hog, and poultry ; while the nations of the south of Europe, the Turks, Persians, and Indians, use that of the goat—an animal justly discarded by us for the inferiority of its flesh and its want of a fleece. The principal animal food of the Chinese is the hog, the dog, the goose, and the duck. In Mongolia the camel and the horse are used as food, as well as the sheep and ox, and the flesh of the wild ass is considered preferable to any venison.

On the subject of flesh for human food, men in different states of society have entertained some strange prejudices; for which, in some cases, however, there has been a good foundation. The nations of Europe have generally been rational on this subject. They have forborne from the flesh of the dog and the horse, because these creatures are intimately associated with man himself, and Europeans are not New Zealanders to eat their best friends.

Besides, the flesh of both these animals is of inferior quality. Cæsar, however, tells us that our British ancestors thought it unlawful to eat a pullet; but this was, I presume, because pullets were very scarce with our forefathers, and kept more for show than use, as we ourselves keep parrots and loories.

It is, however, among some of the nations of the East that the prejudice on the subject of the flesh of animals is carried to the most extravagant length—perhaps in some degree owing to the heat, which makes neglected domestic animals more offensive to the senses, while their flesh undergoes more rapid decomposition. Among the most capricious in this respect were the Jews; and the probability is that the lawgiver found this people, in the matter of food, very dirty and unscrupulous, and that he aimed at making them more particular and tidy, otherwise there seems to have been no necessity for commanding any people of decent habits to abstain from the flesh of birds that feed on carrion, such as kites, crows, and vultures.

There are two animals, however, against the flesh of which the greatest amount of prejudice has prevailed—the hog and dog. The flesh of the hog was interdicted by the religion of the Egyptians, the Jews, and the Mahomedans, the last of whom have raised their horror of a pig to the dignity of a religious dogma, far more regarded than any commandment of the decalogue. The interdiction and the prejudice with them were not unnatural, considering the filthy habits of the hog, a mere scavenger in the domestic state when neglected. The prejudice ceases when the animal is carefully reared, as it is with the Chinese and with all the nations of the same type of civilization with them. The Hindus have the same prejudice against the flesh of the domestic hog as the Mahomedans, and they extend it even to the domestic fowl and duck, which, when neglected, are by no means choice in their diet; but such of them as are not interdicted from animal food altogether, do not scruple to eat the flesh of the wild boar, the jungle fowl, and wild duck—a proof that it is not the animal but the foul habits that are objected to. The chief animal food of the wild inhabitants of Borneo is the domestic hog; and the relinquishment of its flesh has proved the chief obstacle to their adoption of the Mahomedan religion. This was a stumbling-block in the way of his faith, which the Arabian prophet could not have anticipated. When the lower castes of the Hindus of Bengal adopt the Mahomedan religion, the principal change which takes place consists in abstaining from pork and taking to beef.

No prejudice against the hog as food seems ever to have existed among European nations, unless perhaps a small one in the northern part of our own island; but that was before Scotsmen had acquired the art of giving the hog a decent education. Pork was, I believe, the principal animal food of the Romans, or at least of the Roman soldiers; and to show that they did not think it discreditable to deal in hogs, it is reported on credible authority that St. George, the Patron Saint of England, was originally a pork contractor for the Roman army. The Romans are, however, chargeable with underrating the intellects of the hog, which, according to Pliny, they expressed in an odd way, by saying it only had soul enough to take pickle. That was surely a mistake, for the hog is perhaps equal in sagacity to the elephant, and would make an equal display of it had it the strength and proboscis of the elephant.

The ox has been, or is, the special object of veneration among some nations. The Egyptians built temples to it, and with some Hindoos it is held to be a greater crime to kill a cow than to blaspheme a god or murder a man. I have no doubt but that this superstition originated in the utility of the ox in husbandry. In confirmation of this opinion, I may state that it extends to the Japanese, and even to the Chinese, the most indiscriminate flesh-eaters in the world. When the Japanese were preparing to expel the Spaniards and Portuguese, one of the heavy charges made against them was that they "slaughtered animals useful to man," oxen being expressly named; and the offence was coupled with the overthrow of temples, insults to native priests, and the kidnapping of Japanese subjects, to be consigned to foreign slavery.

Putting aside the Esquimaux, who have nothing else to eat, we are ourselves the greatest consumers of animal food in the world, unless it be the men of the same race across the Atlantic, who are perhaps even more carnivorous than ourselves. It is a question of cost; for other European nations would consume as much, if they could afford it.

On the utility of the domesticated animals for labour, it would be superfluous to insist. Without them we should have been in the condition of the South Sea Islanders, as described by Cook, and greater savages than our forefathers, as described by Cæsar, for these were tolerably well provided with them. The animals which man has used for labour are the dog, the ox, the buffalo, the horse, the ass, the camel, the elephant, and the llama.

The labour of the dog is confined to that small and sterile portion of the globe in which Nature, for a portion of the year, has made for him a railway of ice or frozen snow. The ox and buffalo, used also for carriage, are in the East the sole animals employed in draught, and the same remark applies to the least advanced countries of Europe—Turkey, Spain, Portugal, and Southern Italy. We have nearly banished the ox for both purposes. In the East the horse is confined to war and luxury, and, except where Europeans have set the example, never applied to draught, and but rarely as a beast of burden. The camel is the beast of burden of the desert and of dry lands, but totally unfit for wet soils, and in the wet season for regions with periodical rains. The services of the elephant are geographically limited to thirty degrees from the equator, and unknown except in India and in the countries lying between it and China. The horse is the universal hero of labour, suited for all kinds of work, and for their performance in every climate. With ourselves it has nearly superseded every other animal, for by careful breeding we have been able to produce races adapted to every assignable purpose,—some that can draw near three times as much as the elephant can carry, and some that are fleeter than the antelope.

A comparison of the powers for labour of the domestic animals is, at least, a subject of rational curiosity. According to Captain Lyon, quoted by Sir John Richardson, an Esquimaux dog will draw in a sledge a load of a hundred and sixty pounds, going at the rate of a mile in nine minutes. An English dray-horse will draw a ton on a good road, going, however, only at the rate of three miles an hour. In this case, the draught power of the horse is equal to that of fourteen dogs, while the pace of the dog is seven-fold that of the horse, but he must have ice or frozen snow to travel on. On an ordinary road, without ice or snow to slide over, the dog would probably be over-draughted by a load of twenty-five pounds, while his speed would hardly equal that of the horse. In this instance, it would take near ninety dogs to equal one horse. To keep the ninety dogs would be as costly as keeping four packs of fox-hounds.

In India, it has been ascertained by the officers of our commissariat that the average burden of an ass is 50 pounds, of a bullock 200, of a camel 400, and of an elephant 800. The elephant then is equal to two camels, or to eight bullocks, or to sixteen asses. Their respective merits, however, as beasts of burden, cannot be estimated by their mere capacity to carry a load. The first cost of the elephant, for example, is ten times that of a camel, and his keep costs as much as that of eight camels. These disadvantages are, however, in some degree compensated by the greater longevity of the elephant, which is equal to that of man himself, by his better constitution and superior adaptation to varieties of soil and climate. The burden of the Peruvian llama, an animal by the anatomical structure of its foot adapted not to the plain but to the mountain, is about 65 pounds. One camel of the old world, then, is equal to six of the new.

It will appear from the facts now stated that an English dray-horse on a good road will draw the united burdens of two elephants, one camel, and about five oxen, or that his power of transport is superior to that of five of the best camels that Arabia ever produced. A few years ago a meritorious operative, a heaven-born engineer, invented, indeed created a machine, which in speed far eclipses Eclipse or Flying Childers, and which without fatigue can draw the loads of a thousand, or if need were of two thousand elephants. That machine is now at work in the native country of the slow camel and slow and ponderous elephant, an honourable result for George Stevenson and the nineteenth century.

Next to food and labour the domesticated animals have proved of the greatest service to mankind in furnishing them with clothing. In cold and temperate regions, the undressed skins of wild beasts were the only first clothing. In this manner were our forefathers clothed, not only two thousand years back, but in many cases to much later times. Where no animals existed to furnish skins, the inhabitants had, in some cases, recourse to mats of leaves or grass, as in the dress, if it can be so called, of the New Zealanders. This was improved on where the raw material for it existed by paper or papyrus, as in the tropical islands of the Pacific.

In temperate regions, the first step towards manufactured clothing seems to have been the felting of the hair and wool of animals, the only substances capable of undergoing this process. This would be followed by the blanket, which in its rudest form is little better than felt, as we see in the Indian *kamal.* The blanket was probably succeeded by serge, and beyond this, Greeks and Romans seem never to have gone. The Roman toga was a piece of serge, and so was the Imperial purple itself, which was of the colour of stained scarlet, had an ill-odour, and was not for a moment to be compared with the box-coat of one of the Queen of England's coachmen. At a long interval came broad-cloth, an European invention of the middle ages, and a manufacture still confined to Europe and its Colonies. Other textile fabrics of wool or hair are too many for enumeration, such as the shawl made from the hair of the goat, which yields it only when in a dry climate and an elevation of from 12,000 to 15,000 feet above the sea, and camlets, so-called because originally made chiefly from the hair of the camel. In recent times we have had a very handsome tissue from the hair of the llama and alpaca, which goes after the name of the latter, for of the wool of both we now import large quantities.

The distance between the savage and barbarous states is assuredly wide, and that between barbarism and civilization equally so. The scanty garments of our ancestors consisted of the skins of wild beasts, and now are we consuming yearly, of the mere entrails of an exotic domesticated caterpillar, a sum certainly exceeding the value of the fee-simple of our island in the time of the heptarchy.

But, besides furnishing us with food and clothing, the domestic animals supply us with commodities contributing largely to our comforts and necessities, such as hides, horns, hair, fat, bones. Animal dyes, the produce of two little domesticated insects, one of India and one of America, are of importance. Without these two almost microscopic creatures there would be no such thing as scarlet in the world; and the men that defended Inkermann and captured Delhi and Lucknow, although they would have been gallant in any colour, must have fought in one not national.

I conclude, then, that civilization is deeply indebted to the domestication of animals, without which we should surely be famishing, shivering, cowering savages, and most probably feeding on one another, as did the New Zealanders before we converted them to Christianity, taught them to eat beef and pork, to wear broadcloth and sleep under blankets.

MAMMALIA.

The Dog. It is difficult to believe that the endless varieties of the domestic dog could have sprung from a single species, to be diffused over every quarter of the globe, and this, too, to have happened in rude and remote times, when intercommunication was virtually impossible. The great probability is, that particular regions had their own species, as we know them to have of animals of the same family, as wolves, foxes, and jackals. Like some other domesticated animals, they have generally disappeared from the wild state, yet we have still a few exceptions, for India has two true wild dogs, and Australia one. The only plausible argument for unity of species is that the union of every variety results in a fruitful offspring; but this is no more than what happens with closely allied species of other animals, as in the case of oxen and the llamas already mentioned. The probability is that the same would happen, although the experiment has not been tried, with wolves, foxes, and jackals, were they in confinement. It has been ascertained, indeed, that the jackal of Egypt and Senegal, although admitted to be distinct, will breed a fertile offspring.

The varieties of the dog are infinite, every country appearing to have one or more breeds peculiar to itself. Like the varieties of man, too, those of the dog are suited to, and found under, every climate, from the Equator to within the Arctic Circle. Cuvier has observed that the greatest triumph of man over the lower animals has been the domestication of the dog; but it must be noticed that it is a considerable deduction from this achievement that, towards its accomplishment, the dog goes more than half-way to his own domestication. The conquest, then, although the completest, has also been the easiest. Mr. Scott

Nind, in an excellent account of the Australians of King George's Sound, in the first volume of the Journal of the Geographical Society, tells us that the natives do not breed the dog, which they could not afford to do, but content themselves with selecting a few puppies—males it may be presumed—from a wild litter. These become at once domesticated, and when grown, assist the savages in the chase. They are fed, as long as there is any food to give them, and when there is none the dogs hunt for themselves, always returning to their masters, the reverse of what takes place with the horse, the ox, and the hog, which become permanently feral.

The dog, as has been often observed, is the only one of the lower animals that prefers the society of man to that of his own kind. Even when neglected and spurned, he still hovers about his dwellings; and hence the troops of unowned dogs in a half-wild state which are found in almost every country of the East up to the western confines of China and Cochin China, with such varieties in form and colour as prove them to have been once domesticated and owned. They are, in fact, the descendants of the ancestors that hunted with the savages, and discarded as society advanced, when their services were no longer necessary. They are, in fact, a living record of the progress of society. These semi-wild dogs are even evidence of the great antiquity of man himself; for in Palestine and Egypt, and, no doubt in India also, they existed in their present condition thousands of years ago, showing that in these early times the inhabitants of the countries referred to had long passed the hunter state in which the services of the dog were indispensable to them.

The dog in the domestic state has immemorially existed in almost every part of the world—in every country of the old world, among the Esquimaux of America, the Red Indians of the north of that continent, and among the Mexicans and Peruvians of its central parts. It was found among the South Sea Islanders, from the Sandwich Islands to New Zealand and in Australia, both in the wild and domestic state. Among men advanced in civilization, it is in temperate regions only that it is fostered and respected, for in warm ones, owing to its passion for carrion and consequent impure habits, it is neglected; the very dogmas of religion of some of the nations so situated denouncing it along with the hog, for the same reason, as an unclean outcast. It is among the people of Europe only that the dog is highly valued, and this seems to have been the case in very early times. With them, there is no record of their having ever been used as food, although, no doubt, they must have been so when Europeans were yet starving savages, and the dog yet in the wild state. The people of the cold region of Thibet use the dog to watch property, and have no antipathy to him as in warm regions. The

Esquimaux, the Mongolians and Siberians, employ it for draught. An Esquimaux dog will draw a weight of one hundred and sixty pounds in a sledge over ice or snow at the rate of seven miles an hour. The speed is double that of an English horse in a cart on a good road, but the load only one-fourteenth part. The unscrupulous Chinese, and all the people who partake of the Chinese category of civilization, use the dog as food, feeding it for the shambles just as they do the hog. The South Sea Islanders make no other use of him than for food, and some of the North American Indians who use him in the chase also consume his flesh as food. In the hot countries of Central Asia, India, Indo-Chinese, the Malay and Philippine Islands, with rare exceptions for the amusement of the chase, the dog is a mere scavenger, ranking with the kite, the crow, the vulture, and the jackal.

The many distinct names which prevail for the dog must, I think, be considered as evidence of its domestication having been effected at many different and independent points. Thus, in Greek we find the name as *enon* and *enos*, which may be the *canis* of the Latin. This again, variously corrupted, becomes the *cane* of the Italian, the *chien* of the French, the *cão* of the Portuguese, and perhaps the Celtic synonyme *cu*, for which *madadh* is the native word. Our own name runs in one form or another through most of the Teutonic languages. The Spanish language does not in this case follow its cognate tongues, but has a peculiar name, *perro*, a word which has not, I believe, been traced, but may be a remnant of some extinct Iberian tongue. The Basque has no fewer than three names for the dog, *zacurra*, *ora*, and *potzoa*, all of them peculiar to itself. The dog, then, had been early known to the people who spoke this tongue, one older than the pyramids. I will take this occasion to observe, that the domestic animals early known to the Basques have all native names, as the ox, the horse, the sheep, and the goat; while those of recent introduction, such as the camel and the ass, are but corruptions of their Latin ones.

The name for the dog in Arabic is *kălăb*, no doubt the same with the *celeb* of the cognate Hebrew. The Persian has an independent name, *săg*. The Sanskrit has at least two names, *suna* and *kura*; and of the last of these, the *kuttha* of the Hindi and the *kukka* of the Telugu may be corruptions, but in the Tamil the name is wholly different, namely, *nayi*. It may here be remembered that the word *pariah*, applied by Europeans to the semi-wild dogs of India, has no peculiar application to the dog, and is simply an adjective of Sanskrit origin, signifying "strange" and "unowned."

In Malay the name for the dog is *anjing*, but in the neighbouring Javanese *asu*, with the Sanskrit *suna* as a recondite synonyme. The native Malay and Javanese words have been widely spread over the Malay and Philippine Archipelagos, but are by no means universal: for in the Lampung, a language of Sumatra, the dog is called *kuyu*, and in the Endé, a language of the island of Floris, *lakoh;* while in the Bisaya, one of the most prevalent of the Philippine tongues, there are two names for it, *iree* and *ayam*. Even in the dialects of the Polynesian language we find several distinct names for the dog. Thus in the Marquesa it has two names, *nuhe* and *peto*. In the Sandwich Islands it is *ilio*, in the Tonga *guli*, altered in the Maori to *kiri*, which, however, has a name of its own, *kireka*. In the language of Madagascar, which has received a good deal of the Malagan tongues, we do not find the names for the dog among them, for it has no fewer than three of its own, *ambiia*, *kivaki*, and *alikia*.

From the facts now adduced, the conclusions we come to must, I think, be that the original dog consisted of many closely allied species; that the many varieties which exist in the domestic state, especially among civilized nations, are, for the most part, crosses of these, and that his first domestication is of great and unfathomable antiquity.

The Ox. Of all the domesticated animals, the ox is undoubtedly the most useful to man. It is difficult, indeed, to imagine any respectable progress in civilization without it; and, at all events, it is certain that such progress has never actually been made, a fact of which the real barbarism of all the nations of America and of the isles of the Pacific Ocean are illustrations.

Unlike the horse, the ox is still found in the true wild state in several parts of the world, and I have no doubt was once very widely disseminated. In this unreclaimed state it is found, of several distinct yet closely allied species, often capable of union, to the production of a fruitful offspring. The actual number of the bovine family now existing in the wild state amounts to ten, and of these the gayal of Bengal, the gaur of the Indian peninsula, and the paung of Burma, or banteng of the Malay Islands unite, to the production of a fertile offspring, with the common domestic cattle of the respective countries in which they are found. Even the yak of Tibet, an animal which seems very remote from all other domestic cattle, will multiply permanently with the ordinary cattle of the Indian plains, a fact which I state on the high authority of my friend Dr. Falconer.

The domesticated ox has been found in every part of the Old World, from the Equator up to the sixtieth degree of north latitude, and even as far as ten degrees south of the Equator, and this of innumerable varieties as to size, form, and colour. Within the narrow limits of a single country, many varieties are to be found. Thus, within our own islands, we have the small cattle of the mountains, and the large ones of the plains, both of many varieties. In a single province of India, Gujrat, we find the tallest of the family, and creatures not much larger than Leicester sheep.

This infinite variety, which, as far as historical evidence carries us, has always existed, could not have been the effect of mere breeding, for to breeding rude nations pay little attention. Neither can we conceive it possible that man could have, in general, any part in distributing the ox from a single point over so vast a portion of the earth's surface as that in which we find it; for man, in his early, rude, and feeble condition, is wholly incapable of effecting the implied dissemination. I imagine, then, that the conclusion at which we must arrive is, that there existed originally many wild species closely allied, and capable of permanently multiplying, and that from the intermixture of these, and not from a single stock, have sprung the innumerable varieties of the domestic ox.

Language will, I think, afford some corroboration of this view; for in every original tongue there will be found a peculiar and distinct name for the ox, as if each separate people had tamed and named it for itself. Thus, in the Celtic dialects the names for the cow, the calf, and the steer are all native, that for the bull alone being Latin. The name in our own language is the same essentially as in all the Teutonic languages. In all the languages of Europe derived from the Latin, the same peculiar names prevail for the cow, the calf, and the bull. For the animal in all its relations we have separate names in the Arabic, the Sanskrit, the Hindu languages not derived from the latter, in the Hindu-Chinese, and in the Malay tongues. In countries in which the ox did not exist, either in the wild or domestic state, its name is naturally taken from the language of the people who introduced it. Thus, in the languages of the red man of South America and of those of the Indians of the Philippines it is Spanish, while in the native languages of Australia and New Zealand it is English.

With a view to ethnology, it will be necessary to enter into more detail on the subject of names. The Greek *bous* and the Latin *bos* are plainly enough the same word, and from the latter in its ablative case, *bove*, come the different names in the derivative languages, the *bue* and *bove* of the Italian, the *buey* of the Spanish, and the *bœuf* of the French. In the Teutonic tongues, the name is the same throughout, whether written as *ochs* in German or *ox* in English. In the European tongues, much after the manner in which some of the Eastern languages have distinct names for rice and other familiar objects according to their various conditions, we have names for the ox according to sex and age

Thus we have in Latin *taurus* the bull, *vacca* the cow, and *vitulus* the calf, which, more or less corrupted, appear also in all the derivative languages. In the Erse or Gaelic, we find native names for the cow and the calf, namely, *mart* and *laogh,* for a heifer *atherla,* and for the castrated male *damh.* For the cow, however, we have a synonyme obviously from the Latin, *bó,* and for the bull, the only name, *tarbh,* is from the *taurus* of the same language. In the Basque there is a native name for the ox, *idea,* for the cow *beia,* and for the bull *cecena,* an indication that the ox was domesticated when this language took its present form.

The Hebrew name for the ox is *shov,* and the Arabic *tur,* while *gau* equally belongs to the Persian, the Sanskrit, and the Hindi. In the Tamil of Southern India, as usual, we have a name wholly distinct from the Sanskrit, and which for the cow is *pásha,* and for the bull *yerudee.* In Malay the name is *lâmbu;* and in Javanese *banteng* for the wild, and *sapi* for the domesticated animal, the latter name having extended to several languages of the Malay, but not of the Philippine Archipelago. In the recondite language of Java, the native word *sapi,* it may be observed, is accompanied by several Sanskrit synonymes, as *andaka* and *andini.*

In what country, or among what people, the ox was first brought under the yoke of man it is impossible ever to ascertain, but the great probability is that its domestication was effected at many remote and independent points, wherever a species of the family existed amenable to it. On Egyptian monuments, computed to be at least four thousand years old, we find the ox represented of every variety in which it exists in Egypt at the present day. We see it white, black, red, and spotted, with long horns and short horns, and without any horns or polled. But the Egyptians, when these ancient monuments were constructed, were already a civilized people, who must for many ages before have domesticated an animal without the assistance of which they could not have become the civilized they were—assuredly could not have erected the pyramids.

But there exists sufficient evidence of the early possession of the ox by other nations than the Egyptians. Abraham in his migrations between Assyria and Palestine had herds, by the usual chronology, close on four thousand years ago; and about the period of the Exodus, Job had his herds within the confines of Arabia. In Etruscan monuments, held to be three thousand years old, the ox is faithfully represented in the plough, both animal and implement being very much the same as may still be seen at work in several parts of Italy. In the oldest of the Vedas, estimated to be three thousand years old, the ox constituted the most valuable property of the Hindus; and there seems no reasonable ground for supposing that its domestication was not equally early in China, in Japan, and in Tartary the nomadic tribes of which could not have migrated in formidable numbers without the help of the ox. Near two thousand years ago, Julius Cæsar found the ox domesticated in Britain ; and here, indeed, it may have been reduced to servitude perhaps as early as in Egypt itself, although we can produce neither tombs nor pyramids to show that it was. In the pile villages of the Swiss lakes, the remains of two distinct species of oxen, considered to have been domestic, have been found, and these buildings have been computed, or conjectured to be, from nine to twelve thousand years old.

The migrations of the ox are all attributable to the enterprise and activity of man ; left to itself it certainly never would quit its native pastures, and in its wild state never does so now ; such, at least, is the case where we possess historical evidence. Most probably the nomadic nations of Tartary, that invaded Central and Western Asia and Europe, brought with them, and left behind them, some of their own cattle, to be intermixed with those of the countries they invaded. Most of us have seen in the Campagna of Rome a handsome breed of oxen, differing from any of those mentioned by ancient writers, and these are stated to have been introduced by that great vagabond in every sense, Attila, when, in the fifth century, he and his savage Huns invaded Italy.

But the New World has been the great field for the migration of the ox. America had but two of the bovine family, the musk ox and the byson, neither of them amenable to domestication ; but, even if they had been so, they would have been inferior in every respect to the horned cattle of Europe and Asia. The introduction of the European ox into that continent is coeval with the arrival of the Spaniards, and is consequently of no more than three centuries and a half standing. With abundant suitable food, and in the absence of the larger beasts of prey of the Old World, it has multiplied more rapidly than it ever could have done in any of the countries in which it was indigenous,—as rapidly, indeed, as man himself who brought it. It has even regained its liberty and become wild, although without losing the variety of form and colour which characterized it in servitude. We may judge of the importance of this exotic animal to America, when, exclusive of its utility in labour, it forms on the spot the chief animal diet of certainly not fewer than forty millions of people. So planted in the New World, the ox has indirectly become of some importance to the Old, of which we may judge by the fact that we ourselves consume yearly of its flesh, hides, and horns, to the value of full three millions.

Throughout all the islands of the Pacific Ocean, not only the ox but every species of the bovine family was absent. Some seventy years ago, there was not a head of horned cattle on the continent of Australia, and it remained for ourselves to introduce the ox. For some years it continued so scarce, that it required an express permission from the governor to slaughter one. It now thrives in a country which had no native ruminant,—not, indeed, owing to less genial food and climate, as well as in the American continent, but sufficiently so to be capable of multiplying without the help of man. This is sufficiently proved by a well-known fact told by Governor Collins, in his account of the early colony. A herd of five oxen escaped into the bush, and a few years after were reclaimed, the herd numbering fifteen, and, strange to say in it were several bulls, none having been among the animals that had escaped.

In the great and fertile group of the Philippines, the largest island of which is nearly twice the size of Ireland, the ox did not exist when it was discovered by the Spaniards, in the beginning of the sixteenth century. The conquerors introduced it, not direct from Spain, but from America, across the broad Pacific. Here, with the existence of suitable grasses, and in the absence of ferocious enemies (even the leopard and wolf not existing), it has multiplied over all the islands from the 8° to the 19° of latitude. The Chinese, within three hundred miles of the Philippines, and the Malays still nearer, although they introduced the hog and the dog, had not nautical strength and skill competent to the introduction of the ox, or the horse, or the buffalo. The illustrious buccanier and navigator, William Dampier, shot Spanish oxen, run wild on the remote island of Mindano, within a hundred and twenty years of the settlement of the Spaniards in the Philippines.

On the manifold services rendered by the ox to man it is unnecessary to dilate. Without him the earth could never have been brought into effective tillage, for in most parts of the world the horse was far too precious to be used in the plough, and the ass, which was so, was but a poor substitute for the ox. The civilizations of Greece, Italy, Western Asia, India, and China would never have existed but for the ox. The migrations of the pastoral tribes of Tartary are effected only by its means, their very existence, indeed, depending on it, since it yields to them food as well as transport. When, however, it enabled Attila and Xerxes, and Timur, leading hordes of these people, to sweep over the civilized world, and when it brought Turks from Transoxiana to Constantinople, its services to mankind must be considered as more than questionable.

Among the more advanced nations of Europe, the ox has been in a good measure superseded by the horse, and to discard him for mere labour is evidence of civilization. With the less advanced of these, it is still the only animal used in the plough. In Africa and Asia, without the tropics, it is the only beast of draught, and as a beast of burden shares with the camel; while within them it is employed in common with the buffalo in draught and carriage. There is no going fast ahead with the ox for labour, and so the Americans of our own blood discard it as we do; while those of the Spanish—slow, backward, and anarchical—retain it.

It is chiefly in temperate regions that the milk of the cow contributes largely to human sustenance, and in some countries towards the equator it is not used at all. The Cochin Chinese told me when I was in their country, that they would as soon think of drinking raw blood as milk. In Java, which has a fine breed of horned cattle, I have kept myself a score of native cows without being able to get milk enough for tea and coffee. The cows of that island spare very little milk while the calf suckles them, and refuse it altogether if the calf be taken from them. I have no doubt, however, that this is more owing to the breed than to the climate, for the cows of India yield abundant milk from the Himalayas to Cape Comorin, while such of the Indian breeds as have been transplanted to Java yield milk as in their native country.*

Certain nations of the East entertain a prejudice against slaughtering the ox for food, the origin of which most probably arose from its utility in agriculture. In one form or other this superstition extends from India to Japan, including even the Chinese, so unscrupulous in diet that the flesh of the dog, the alligator, and the python do not come amiss to them. Among the charges made by the Japanese against the Portuguese and Spaniards prior to their expulsion from the empire was the slaughter of animals useful to man, the ox and cow being expressly named, and the charge was considered so heinous in their eyes that it was up with the overthrow of temples, the persecution of native priests, and the kidnapping of Javanese subjects to be sold abroad as slaves. It is remarkable that for their slaughter of kine the Portuguese pleaded ignorance, and engaged not to repeat the offence. By recent accounts, I see that our countrymen can obtain no beef in Japan, and naturally complain of it as a serious grievance.

The followers of Buddha take a different view of the matter: they will not slaughter any animal whatever, but do not scruple to partake of the flesh of almost any animal that any one else has killed, or that has died a natural death. I have seen a crowd of Burmese round a dying ox or horse, waiting the last gasp to cut up the carcase. And even worse, I have seen them in their canoes cutting steaks from the bloated carcase of a horse or an ox, as the tide carried it down the stream of the Irawaki. But it is among the Hindus that the prejudice against taking the life of the ox is the most intense: with them, indeed, the animal is almost deified. They are not, however, quite consistent in this matter: for while they are great consumers of cow's butter, they make the greasing of rifle cartridges the pretext of a murderous rebellion. Among European nations no prejudice has ever existed against the slaughter of kine, or the use of their flesh; and of all beef-eaters, we ourselves have long maintained, whether as to the quality or quantity consumed, the highest reputation.

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* To this I may add, on the authority of Captains Speke and Grant, that milk is the chief food of the Negro nations of Africa, even at the very Equator.

With the Indian army the average load of a bullock is considered to be two hundred pounds, two bullocks being considered equal to a single camel, and four to one elephant. For draught, two bullocks are hardly equivalent to a single horse, and the horse here compared with it is an Indian one. In England, it takes a team of four oxen to draw a plough, a labour which is more quickly and equally well performed by half the number of horses. To draw an eighteen-pounder over Indian roads requires a team of eighteen bullocks, and sometimes one of twenty-four. The speed, in this case, is at the rate of two or two and a half miles an hour, and then only with much shouting, much goading, much twisting of tails, and torrents of vituperation of the sacred animals by Hindus who are always the drivers. Four English dray-horses would certainly do the work with more speed and effect than the eighteen or even than the twenty-four Indian bullocks.

The ox has over the elephant and camel the advantage of a hardier constitution, for its capacity for labour embraces the climates and localities of both.

The Buffalo. This animal, the *Bos bubalus* of naturalists, is a very different animal from the ox of any country, and will not intermix with it, even to the production of a sterile hybrid, as does the horse with the ass. Naturalists appear to have come to an understanding that the buffalo no longer exists in the wild state, unless the wild buffalo be the arnee of Bengal, which, however, very materially differs from the domestic buffalo of whatever country. The buffalo is a much larger and more powerful animal than the ox of the countries in which both exist together, but it is more sluggish, slow, and unwieldy, with less capacity for enduring toil, especially in the heat of the sun. It is, in fact, a denison of the marshes, and loves to roll, or rather to half bury itself, in the mud; often it may be found by the side of a pool with nothing visible but its snout.

The buffalo does not sport either as to form or colour as does the ox, for its form is everywhere the same, and in colour it is either black or white, the first being in the proportion of ten to one the most frequent, and the latter being seemingly an albino. It varies greatly, however, in size, the largest and most powerful being found in the neighbourhood of the equator, in such countries as the Malayan Peninsula, Sumatra, and Java. It diminishes in size as we proceed northward, and in Upper Hindustan is not larger than the common ox.

The buffalo has a decided antipathy to strangers, and more especially to strangers dressed in conspicuous colours. A distinguished officer, the late Colonel Syme, who was my predecessor in a mission to the Burman Court, describes himself as pursued by one, and saving himself only by doffing his scarlet coat. On the other hand, with its friends it is docile and obedient, and thoroughly under control. Looking out of my window one morning while at Surabaya, in the island of Java, I saw two bulls fighting. A little boy, apparently about ten or twelve years of age, came up, and gently touched his own buffalo on the nose with a switch; the animals immediately desisted from fighting, and his own animal, bending its horn down for a stirrup, the little fellow mounted on his neck and rode home, the opponent quietly taking himself off. With this gentleness, the buffalo is an animal of indomitable courage, and with this quality and his great strength he is an over-match for the royal tiger. The combat between them is a favourite amusement of the princes of Java, which I have often witnessed, and in no case did I ever see, or indeed hear, of the buffalo being worsted. Frequently he has killed the tiger, and always laid him prostrate and incapable of further effort, his life being saved only from the position of the buffalo's horns being such as to disable him from goring his enemy to death: indeed, on such occasions, the tips of the buffalo's horns are usually sawn off, as a further security against such a catastrophe.

In the hot and moist countries towards the equator, the buffalo is of more frequent use than the ox in all the labours of agriculture. In these it is to be seen, in the rich rice field, up to its knees in mud, drawing the plough and harrow, and this seemingly to its own entire contentment, while the labour of the ox is restricted to the tillage of the far less valuable uplands. It gives more milk in such localities than the cow, but of inferior quality, and its flesh, and even its hide and horns, are very inferior to those of the ox.

The buffalo is at present numerous in all the inter-tropical and sub-tropical countries of Asia, and was probably first domesticated at several independent points within these limits, from

Hindustan to China, a fact which would seem to receive corroboration from its having a distinct and peculiar name in every different group of languages. To Greeks and Romans it was unknown, and is no where represented on the ancient monuments of Egypt, Persia, and Assyria. To the Hindus, however, it must have been early known, for it has a specific name in the obsolete Sanskrit, which, in corrupt forms, has been extended to several other languages of Hindustan. It is found, also, represented on ancient Hindu monuments, but is not venerated like the ox: on the contrary, it is associated by name with a certain mischievous demon, the Mahesasura, literally the buffalo demon, and the destruction of which is one of the great achievements ascribed to a renowned deity of the Hindus, the goddess of destruction.

The name for the buffalo, in all the modern languages of Europe, is taken from the Latin *bubalus*, which is a term originally applied to some kind of wild cattle, and transferred to this animal when introduced into Europe. The Arabic name for it is *hărmis*, and the Persian *jamus*, or *gamus*. The Sanskrit name is *mahisha*, of which the Hindi *bhains* is probably a corruption; but that language had also the native name *khulga*. The wild animal is called *arki*. In the Teluga and Tamil it has the native names respectively of *yenuma* and *yerumi*. In the Malay the name is *kôrbo*, and in Javanese *kâbo;* the Sanskrit name *mahisha*, omitting the aspirate, being used in the polite dialect of the latter. The word *kârbo* has been widely spread over the Malayan Archipelago, usually in a corrupted form. It has been extended to the Philippines, with the orthography of *carabo*, although into these islands the animal was introduced by the Spaniards. I find it also as a synonyme in Siamese. It is not, however, the sole word in the Malayan languages, for in the Sunda of Java the name is *munding*, and in the Bugis of Celebes *tedung*.

At present the buffalo is found in Persia, Syria, Egypt, Greece, and as far west as Spain and Italy, in the last of which many of us have seen it engaged in the congenial labour of dredging with their bodies the canal which passes through the Pontine marshes. It was evidently the conquests of the Arabs, connecting as they did the Eastern and Western world in a manner more intimate than was ever done before, that introduced the buffalo into the latter. The Arabs, receiving the buffalo from India, directly or indirectly, brought it into Assyria, Syria, Asia-Minor, and Egypt; and its introduction into Europe dates no further back than the time of the Crusades. The poverty of the coat of the buffalo, which consists only of widely scattered hair, declares it to be the inhabitant of a warm climate, and one is only surprised to find it acclimated even in so comparatively cold a country as Italy. This, with its slowness, the inferiority of its flesh, of its milk, and even of its hide, evidently unfits it for any other than its native country—the hot and moist region in the proximity of the Equator.

The Horse.—The horse—the noblest conquest of man over the lower animals, although not the most difficult, for in this respect it must yield to the elephant, as in utility it must to the ox—is at present nowhere found in its original wild state, although the ass and the ox unquestionably are so. A true wild horse was supposed to exist in the mountains of Thibet; but a specimen of this animal has at length been brought to England, and is now to be seen in the gardens of the Zoological Society. It is, however, of the family of the asses, somewhat taller than the true wild ass, lighter in the shoulder, longer in the neck, with shorter ears and a more horse-like head. It is, in fact, I am assured by an eminent naturalist, my friend Dr. Falconer, the Djiggatai of the Moguls, and hunted by them for its flesh—considered by Tartars to be better than any venison.

In the domesticated state, the horse has immemorially existed in every region of the Old World, the Arctic excepted. His disappearance from the absolutely wild state is probably to be accounted for from his natural habitat being the open plain; from the facility with which he would hence be captured, and when captured, tamed, domesticated, and made useful.

As we now see him, the horse consists of an almost infinite variety, differing in size, in form, in colour, and even in disposition. Much of this variety has, no doubt, been the work of man, but it is so great that it is difficult to believe, when we consider the insuperable difficulties to intercommunication which existed in early times—always rude times—that all the widely differing races could possibly have sprung from a single species, or that time, soil, climate, or breeding, could have produced so prodigious a diversity. To account for it, then, I think we must come to the conclusion—and I am not the first that has come to it—that there must have existed originally a great number of closely allied species capable of commixture, and of producing a fertile offspring. Such is certainly the case with the ox and the dog, and probably even with the human race itself.

For this inference a good deal of evidence might be produced. Thus language countenances the theory. In every original tongue of countries in which the horse appears to have been indigenous, as far as I have been able to discover, it has a peculiar and distinct name. Thus, it has a distinct name in Greek, in Latin, in German, in the Celtic tongues, in Persian, in Arabic, in Sanskrit, in the languages of the South of India, in the Hindu-Chinese tongues, and in the languages of the Malayan Islands. Sometimes it has two names, a native with a foreign synonyme, as in Irish or Gaelic, and in Javanese—in the first case the synonyme being Latin, and in the last Sanskrit. In countries in which the horse had unquestionably no existence, it naturally takes its name from the language of the people who introduced it. In South and Central America, and the Philippine Islands, the name is Spanish, taken from the Latin ; and in North America, Australia. and New Zealand it is English.

There are two broad distinctions in the horse—the full-sized one and the pony—which seem to point, at least, at two distinct aboriginal races, or osculating species. No change of climate or skill in breeding, supposing there be no crossing, will convert the one into the other. In most countries both exist together ; but in some one of them only exists. Thus, in the intertropical countries which lie between India and China, and in the islands of the Indian Archipelago, the pony only exists, and the full-sized horse is as unknown as the ass or the camel. In the languages of these countries, consequently, there is but one name for the horse, while in the language of Hindustan and Persia there are distinct terms for the horse and the pony. In Arabia the horses are all comparatively small, and do not materially differ in size : there are there no ponies, and consequently, in the copious Arabic language, no distinct terms for horse and pony. It may be suspected that the same was the case in some of the poorer and remoter parts of the British islands, for in the Celtic languages the pony has no other name than " little horse."

Soil and climate, independent of the care of man in feeding and breeding, of which, in the ruder states of society, the horse receives little or none, seem to have very little influence on its size, form, or disposition. In the temperate western parts of Europe it is found of a size never seen in any part of Asia or Africa : it thrives even in countries in which nature had not originally planted it, and this applies to every region of America, from the equator to Terra del Fuego. Over this wide region, with some allowance for patent neglect, it is still the Spanish horse introduced about three centuries ago. In the absence of powerful carnivorous animals, and with unlimited pasture, it there multiplies much faster than it could at any time have done in any part of the Old world,—so fast indeed as, in many cases, to have regained its liberty, and to have returned to its wild state, yet even then retaining that variety in colour which marks its once subjection to man.

Like America, the Philippine Islands were found without the horse. The Spaniards introduced it, but in this case they introduced the Spanish horse from South America, and, along with it, the pony of the neighbouring Malay Archipelago, and the result is that the breed of horses of these islands is a kind of galloway, intermediate between the two races. Here, too, under conditions as favourable as in America, it has run wild.

The southern hemisphere opposes no obstacle to the successful multiplication of the horse, since we find the different breeds of the English horse thriving nearly as well in Australia, New Zealand, and the southern extremity of Africa, as in the country from which they came. In countries to which the pony is indigenous the full-sized horse thrives perfectly, as is seen from its introduction, in very recent times, into Java and the country of the Burmese.

The notion that all the different races of the horse have proceeded from one original stock has no warranty in history. As long as the horse receives no special care in breeding, he undergoes no change, and such care he only receives in a considerably advanced state of society, or where, as in the case of the Arabs, he is an object of special and peculiar importance. The half wild and neglected horse of South America does not materially differ from his progenitors introduced by the Spaniards above three hundred years ago, and our own Shetland and Welsh ponies most probably differ in no respect from their predecessors of the time of the invasion of Julius Cæsar. The squab, strong, and enduring Tartar horse of the present day is, in all likelihood, the same kind of animal by help of which Attila, and Gengis, and Timur effected their conquests—the same with which the Tartar tribes subdued China twice over, and against whose incursions a wall of 1,500 miles long was no security. It is the same, too, which the allied armies encountered in their march on Pekin —a shaggy rough galloway, under fourteen hands.

Through the care of man it is needless to add that vast improvements have been effected in the horse. This care, as is well known, has been long bestowed by the Arabs. It is certain, however, that in Arabia, as in every other country, a native race must have existed, to afford the materials for selection. In sacred writing, Solomon is represented as purchasing his stud, not in Arabia, but in Egypt, from which it has been very hastily inferred that the last of these countries, and not the first, is the parent country of the high-bred Arab such as we know him. For this notion, however, I can see no good foundation. The Egyptians of the time of Solomon were a civilized and wealthy people, with abundance of horses, and the Israelite king naturally went for his to the best or most abundant market, which was Egypt. The Arabs of the same period were a rude, nomadic, and isolated people, and so they continued for a long time after, until, indeed, Mahomed, in the seventh century of our own time, "breathed," as Gibbon expresses it, "the soul of enthusiasm into their savage bodies," and made them an united, a conquering, and in many respects a prosperous people. It was most probably then only that they began to pay special attention to the breeding of the horse, and the result of which has been the production of that animal which, in so far as form, bottom, and beauty are concerned, is considered the perfection of the blood horse. He is, however, in size what we should call a mere galloway, and when in perfection seldom exceeding fourteen and a half hands high. He cannot be said to be master of a weight exceeding ten stone, and yet there is some adaptation of his strength to the usual class of riders he has to carry, for the man of Asia is much lighter than the man of Europe. In India it has been ascertained that on an average the Indian trooper is lighter than the English light dragoon by no less than two stone and a quarter. The difference between the Englishman and the Arab is probably not so large, but still it must be very considerable.

The Arab horse has been justly praised for its gentleness and docility, qualities generally ascribed to their rearing and tuition. I am, however, satisfied that this character is far more owing to the natural temperament of the race; for it sometimes happens that an Arab is vicious, and when he is, he is exquisitely and incorrigibly so. There is one quality in which the Arab horse perhaps excels every other, endurance of continuous labour. A little Arab of fourteen hands, for a bet of £500, rode four hundred miles in five consecutive days, or at the rate of eighty miles a day, carrying ten stone seven pounds. The feat was performed on the race-course of Bangalore, but 13° distant from the Equator. The horse was Jumping Jemmy, and the rider, as meritorious as his horse, Captain Horne, of the Madras Artillery.

I may here give the description of a genuine Arab, more lively than any other that I am acquainted with. It is that of Evelyn, and in excellent quaint English. In the year 1683 the Turks, under their Grand Vizier, invested Vienna, and the Emperor of Germany and his ministers fled. John Sobieski, elective King of Poland, came to the rescue. The Turkish army was entrenched, and the Grand Vizier, in Turkish fashion, was taking the matter coolly and quietly, for he was seen from a neighbouring height smoking his chibouk, and sipping his coffee. Polish blood could not stand such a sight, and the Polish cavalry, lance in hand, cleared the entrenchments, entered the Turkish camp, routed the army, and pursued it to Hungary, and beyond it. For this service, in less than a century, the Poles were requited, after a peculiar fashion, by having their country partitioned, and a large slice of it taken by the descendants of those who but for them might have been now crying "Bismillah" instead of being in league with the Pope. Some Arab horses were among the spoil, and were brought for sale to England, and exhibited before Charles II. The following is the account given of them in the Diary:—"Dec. 17th, 1686. Early in the morning I went into St. James's Park to see three Turkish or Asian horses, newly brought over and first shown to his Majesty. There were four, but one of them died at sea, being three weeks coming from Hamburgh. They were taken from a Bashaw at the siege of Vienna, at the late famous raising of that leaguer. I never beheld so delicate a creature as one of them was, of somewhat a bright bay, two white feet,—in all regards beautiful,—a blaze: such a head, eyes, ears, neck, breast, belly, haunches, legs, pasterns, and feet—in all regards beautiful, and proportioned to admiration; spirited, proud, nimble, making halt, turning with that swiftness, and in so small a compass as was admirable. With all this so gentle and tractable as called to mind what Busbequius speaks of them, to the reproach of our grooms in Europe, who bring up their horses so churlishly as makes most of them retain their bad habits. They trotted like does, as if they did not feel the ground. Five hundred guineas were demanded for the first, three hundred for the second, and two hundred for the third, which was brown. All of them were choicely shaped, but the two last not altogether so perfect as the first. It was judged by the spectators, among whom was the King, the Prince of Denmark, the Duke of York, and several of the Court, noble persons skilled in horses, especially M. Faubert and his son, Provost Masters of the Academy, and esteemed of the best in Europe, that there were never seen any horses in these parts to be compared with them."

The present races of the English horse are, with the exception of the ponies, a very mixed breed. Our draught horses are in a large degree derived from the horses of Flanders, and it is by no means improbable that our Saxon forefathers brought with them some of the heavy horses of Holstein and Sleswick. An indigenous full-sized horse, however, certainly existed in the time of the Roman dominion. It was this, most probably, that was used in the scythed chariots of the Britons. It was, at all events, possessed of such good qualities as to be much sought after on the Continent. From this horse and the blood of the Arab has sprang our famous race-horse, far exceeding in fleetness all others. The Arab, for breeding, seems first to have been introduced in the beginning of the seventeenth century, in the reign of James the First. In about a century's time, or ending with the time of Queen Anne, all the benefit derivable from the Arab blood seems to have been completed. It is certain, however, that the original unmixed English horse, from which the race-horse derives its size and strength, must have possessed excellent qualities, for we have in proof the fact that Flying Childers, supposed to be the fleetest horse that England ever produced, was the immediate offspring of an English mare, by the Darley Arabian, a genuine Arab of the Desert—that he was, in other words, a half-bred, a fact which seems to be implied by his portraits; for although his other points appear unobjectionable, he has a large coarse head, such as a true Arab never has. The celebrated Eclipse traced his pedigree not very remotely to the Godolphin Arabian, which has been supposed by some to have been a Barb, but I fancy only from the fullness of his crest. If the account I have heard be true, that he was a present from the Sultan to Louis the Fourteenth, the probability is that he was a true Arab, for the Sultan could easily have got one without going to the mixed blood of Barbary.

Although, however, no account is given of the dam of Flying Childers, it is likely that she may have had some Arab blood, for the horse was of the time of Queen Anne, before which, Spanish, Barb, and even Arab horses had for one hundred years been introducing into England.

If, then, the Arab blood be the only true one, there is no such thing as a thorough-bred English horse. Our race-horse, with all its perfection, is, in fact, a factitious breed. That it is mostly derived from the Arab, however, will probably be inferred from its corresponding with it very perfectly in colour. With the Arab, the prevailing colours, in the order of their frequency, are grey, bay, and chestnut. It is never sorrel, roan, or piebald, and very rarely black; and such also is the case with the English blood-horse.

The superior speed of the English racer over the Arab has been frequently determined, as might well be expected from an animal on an average by two hands higher, with every racing point at least equal. In 1814 a second-rate English horse, Sir Solomon, ran a race of two miles, on the course of Madras, against an Arab, which, giving heavy weights, had beaten every other Arab in India. This was the Cole Arabian afterwards brought to England. He was under fourteen hands high, and received a stone weight. The English horse, an ill-tempered one, ran sulkily during the first part of the race, and there was every appearance that he would be distanced, but in time he ran kindly, overtook the Arab, and beat him handsomely. His success was followed by the acclamations of thousands of natives who were assembled on the course. This statement I had from an eye-witness. In 1828 the English horse Recruit beat easily the Arab Pyramus, the best at the time in India, giving him two stones nine pounds. The distance, ran on the race-course of Calcutta, was two miles.

A few years ago a match was run between an English blood-mare and the best Arab in Egypt. The race was ten miles long, over the Desert. For the first mile the horses went neck and neck, after which the mare ran a-head, and before the race was over the Arab was left behind, and out of sight. In fact, the difference in speed between the English racer and the Arab is something like that between the antelope and the hare.

The European cavalry horse of the middle ages was of necessity a powerful animal, since he had not only to carry a rider covered with armour, but had armour of his own to bear. The same kind of horse seems to have been continued even down to the Revolution, as we see it represented in the equestrian statues of Charles the First and William the Third. Sir Walter Scott, in his "Crusaders," gives a very graphical account of the war-horse of the middle ages, as contrasted with the Arab, in his imaginary duel between Cœur de Lion and Saladin in the Desert.

The Arabs occupied Spain for seven centuries, and the African shore of the Mediterranean they have possessed for twelve, and from the intermixture of the blood of their horses with that of the native races have been derived the jennet and barb. A good native horse, however, probably existed in both countries, and indeed with respect to Barbary, it may be considered certain, when we know that the Numidian horse formed the best cavalry of Hannibal, and contributed largely to his victories over the Romans. The Barb has as little chance as the Arab with the English blood-horse. In the present season (1863), a fine Barb ran for the Goodwood Cup, and was distanced by both English and French horses. The Persian horse is said to have some Arab blood, but it cannot be large, for the modern horse does not materially differ from that represented with great spirit and seeming truth in a celebrated mosaic pavement of Pompeii, which is, at least, by seven centuries older than the conquest of Persia by the Arabians. The horses of the mosaic are, in fact very ordinary animals, without the smallest show of blood, and so generally is the modern Persian horse.

But, besides those already named, there are different breeds of horses in various parts of Asia, and, seeming to be endemic in the several countries in which they are found, without any admixture of foreign blood. Such a race is the squab, strong, and sure-footed little horse of Butan, called the Tangan, frequently imported into Bengal. The small horse of Tibet is another instance. Like the shawl goat, and all the other animals of the elevated and dry region which it inhabits, it has a double coat of hair, a long shaggy outer one, and at the roots of this a fine woolly one corresponding with that which in the goat is the material of the Cashmere shawl.

The horses of the plain of Hindustan are of ample height, and considerable activity, but wanting in strength, and above all in bottom, and very often vicious. It is remarkable that the best breeds are found towards the south, and especially in Central India, and the worst towards the east, including Bengal and Orissa. As no remarkable care in breeding is anywhere bestowed by the Indians, the superiority of the horses of such countries as Mysore, Cattewar, Gujrat, and Malwa, may be attributable to a peculiar suitableness of soil and climate, and probably to the introduction, in remote times, of some portion of Arabian blood. In general the Indian horse is what the Irish, and sometimes the Scots, call a "garron," that is a vulgar hack. At all events his inferiority is declared by the necessity we are ourselves under of going to the Persian and Arabian gulfs, to the Cape, and to Australia, for better. One flagrant misnomer which Europeans apply to the common Indian horse may be noticed. He is usually known to them under the appellation of Tazi, meaning jade,—almost "screw," whereas the word, which is Arabic, properly signifies a true Arab.

Proceeding south we have the Burmese or Pegu pony, and among the islands of the Indian Archipelago, from Sumatra to Timur, a great variety of races, for every island possessing the horse has, at least, one race, and the larger several. Among these the most remarkable is the horse of a certain volcanic island, called Sumbawa, and more especially of a district of it called Gunung Api, literally "fire mountain," or, in other words, "the volcano." The Sumbawa horse is generally below twelve hands, and its most remarkable colours grey and bay, occasionally sorrel, but, as with the Arab, rarely black, and never piebald. It has the legs and the blood-head of the Arab, its spirit, bottom, good temper, and proportioned to size, more than its strength. Of these I remember that the late Sir Stamford Raffles presented a set of four to the Princess Charlotte of Wales, which she drove in Windsor Park. With relays of these insular ponies I have myself, as did many others of my contemporaries, ridden one hundred miles an end, at the average rate of ten miles an hour. The weight carried in my own case was full thirteen stone.

The most current name for the horse of the Indian Archipelago is the corruption of a Sanskrit one, and from this circumstance it might at first sight be supposed that the animal was introduced from India. For this, however, there is no foundation, for the Indian name is but a synonyme; and in the language of Java, where the horse is most numerous, and which is the chief seat of Hinduism, the current name is a native one. In one of the principal languages of the great island of Celebes the horse bears the Javanese name, while in another it is known by the odd one of the "buffalo of Java." In Celebes, which contains extensive grassy plains, and no tigers, the horse is found in the wild state, caught with the lasso, and reclaimed, as in the llanas of America. From these facts, we may be disposed to infer that the Javanese, long a civilized people, taught the people of Celebes —a very rude one, even when first known to Europeans—the art of domesticating the horse. It may be added, in corroboration of this view, that the horse of Celebes differs materially from that of Java, being larger, stronger, and better bred.

Proceeding eastward and southward, the horse is found, for the last time, in Timur and Sandalwood Island, each of which has a race peculiar to itself. In no island of the North or South Pacific Ocean was the horse found. Going northward, after quitting Borneo and Celebes, we find a native horse, for the first time, in the Japanese Archipelago. This would seem to be a peculiar race, if the horse of Japan was not imported from the rude countries on the Gulf of Okotsk which, considering the state of Japanese navigation, is not very probable. Here we have no longer the mere ponies of the Indian Archipelago, but the full-sized horse, which old John Adams, a mariner, born and bred in Wapping, and a mighty favourite of the Emperor of Japan of his day, writing from the spot in 1613, thus describes:—"Their horses are not tall, but of the size of our middling nags, short and well trussed, small headed, and very full of mettle; in my opinion far exceeding the Spanish jennet." My friend Mr. Oliphant, in his interesting narrative of Lord Elgin's mission, confirms this statement, and gives the following curious account of the *manège* of a people as numerous as ourselves, and of whom, for two hundred and fifty years, we have known nothing but their lacquer-ware, curious porcelain, and strange political isolation.

"As Lord Elgin had not yet seen much of the town, I accompanied him on shore, on another tour of exploration. In the course of our walk we came to a large enclosure, and on entering it found fifteen or twenty men on horseback, galloping and curvetting about a considerable area, apparently used as a riding school. This, we understood, was the constant afternoon amusement of the 'young bloods' of Nagasaki. They were all men of fortune and family, princes and nobles of the land, and this was their Rotten Row. They rode fiery little steeds, averaging about fourteen hands in height, and took a delight in riding full gallop, and pulling up short, after the favourite manner of Arabs. The saddles were constructed on the same principle as they are in China, but with less padding. The stirrup-leathers were short, and the stirrups like hugh slippers, made of lacquer. The bit was powerful, and the reins made of muslin, but strong, notwithstanding. When we appeared, two or three good-looking young men pulled up near us, and most good-naturedly pressed them upon us. I took a short, uncomfortable gallop upon one with a propensity to kick, and was glad soon to relinquish him to his smiling owner. We were much struck with the gentlemanlike and unconstrained bearing of these young men, who evidently wished to show us all the civility in their power."

From all the facts now detailed, the great probability seems to be that in many countries there existed distinct races of the wild horse, which, in due time, their respective inhabitants reduced to servitude. Scattered as they are over the greater part of the Old World, consisting of widely different varieties, and considering the extremely rude state of the intercourse, but more especially of maritime intercourse, of the early nations, most of whom were even ignorant of each other's existence, it is difficult even to imagine that all the horses of the world were derived from one single stock. Neither the Hindus nor Arabs had carried their horses to the islands of the Malay Archipelago, although they communicated to them their religions, and a very considerable portion of their languages. The Malays and Javanese did not succeed in conveying their horses to the islands of the Pacific, although they did a considerable portion of their languages, with some of their plants—as the yam, the coconut, and sugar-cane. Close to these two nations was the Philippine group, and to the inhabitants of this the nations in question communicated a considerable portion of their languages, and even a smack of their religion; but it remained for the Spaniards to bestow the horse upon them. The large and fertile island of Formosa is but eighty miles distant from the populous coast of China, but the Chinese had never occupied it until Europeans showed them the way to it, only two centuries ago. They have ever since then occupied it, colonized it, and drawn large resources from it, but down to this day have not introduced the horse.

Attempts have been often made to trace the first domestication of the horse to a particular country, but the inquiry seems to me an idle and unnecessary one. Wherever the horse existed in its wild state it would very easily be domesticated, and, consequently, in many different and independent localities. It was not found domesticated in America, or Australia, or the Isles of the Pacific Ocean, because in these parts of the world it did not exist in the wild state, and in a rude state of society, it could not possibly have been conveyed to them from the countries in which it was indigenous. The case was different with the dog: it existed, most probably, in all the countries in question in the wild state, and was consequently found in the domesticated in all of them.

The era of the first domestication of the horse must have been very remote indeed, for it required but a very small amount of civilization in the men who achieved it. This is sufficiently proved by the fact that some of the rude tribes of America had, within fifty years of the discovery of the New World, domesticated the horse, already become wild,—and that they have ever since continued to make use of it, and, by so doing, been able to maintain a rude independence, assuming, in some degree, the nomadic habits of Arabs and Tartars.

The domestic, but not the wild or the feral horse, is a frequent subject of representation on the monuments of Egypt, estimated to be of an antiquity of some forty centuries; but this is very far from carrying us back to the first domestication of the horse; for when the Egyptian sculptures and paintings were executed the Egyptians were already in possession of many of the useful arts, and had even invented letters,—were, in fact, an ancient civilized people, and, for aught we know to the contrary, the horse may have been domesticated in Egypt four thousand years before the time in which it was represented on its monuments. If this reasoning be valid, the probability is that the horse was just as early domesticated in other parts of the Old World, from the British Islands to Japan, as it was in Egypt.

The first use to which the horse would be put must have depended on the character of the people and country in which it was domesticated. Riding must have been the first use to which it was put, for it is not easy to suppose that it would have been tamed and broken in without being first mounted. The earliest purposes to which it would be put would be to war, travel, and pleasure. It is only in very advanced periods of society that it is applied to agricultural and other useful labours. In this it is anticipated or superseded by the ox in most countries, and by the ox in conjunction with the buffalo in others. It is only in very advanced periods of society that it is used for draught, and this chiefly in modern Europe—a matter, however, which seems to be in some measure determined by the superior size, weight, and strength of the races of this part of the world. Throughout all Asia, and indeed throughout the whole of Eastern Europe, the horse is nearly unknown for draught, either in plough or carriage, while with ourselves it has justly superseded the slow and heavy ox—clear evidence of a superior intelligence and civilization.

On the ancient monuments of Egypt, the horse is almost always seen in draught only—a pair drawing a two-wheeled chariot, with a pole, in the manner of a curricle. A pompous display would seem here to have been the only object. One or two samples only occur of a man on horseback, and then sitting not astride, but sideways, without bridle or saddle, and as it were, in mere frolic. But in due time the Egyptians came to have a cavalry, for when the king of Egypt pursued the Israelites, after their escape from bondage, he did so with horsemen as well as with chariots, and this is supposed to have happened about 1500 years before the birth of

Christ. The ancient Britons had their war chariots, while Gauls, Numidians, and other cotemporaries, hardly more advanced, had cavalry, but not chariots. Whether cavalry or chariots were used in war was probably a matter of chance. I may here remark that the mere capacity to construct a wheel carriage, however rude, is a fact which shews that in the days of Julius Cæsar we were not such arrant savages as we have been sometimes represented. We had not only the skill to construct chariots, but even to arm them with iron scythes. The iron, no doubt, must have been rather scarce, for we used it at the same time as our only money, and probably valued it as highly as the Roman conquerors did silver.

The horse is the universal hero of labour, suited for all kinds of work, and for their performance in every climate. His almost exclusive employment in labour is in itself evidence of a high civilization. With ourselves, by careful breeding, we have been able to produce races adapted to every assignable purpose—some that can draw three times as much as the elephant can carry, and some that are fleeter than the antelope. The horse is the only animal that enters the field of battle with us. He even partakes "the rapture of the strife," and without him no great decisive battle could be fought; or, in fact, ever has been fought. "The glory of his nostrils is terrible. He paweth in the valley, and rejoiceth in his strength. He hurries on to meet the armed men—he mocketh at fear—he turneth not his back from the sword. The quiver rattleth against him—the glittering spear and the shield. He swalloweth the ground with fierceness and rage; neither believeth he that it is the sound of the trumpet calling a retreat. He saith among the trumpets, ha, ha! and he smelleth the battle afar off, and heareth the thunder of the captains and the shouting." That well-known passage is taken from the Book of Job. I cannot help thinking that the animal so well described in it, with glory in his nostril, and pawing with impatience for the charge, must have been no other than a true Arab. In fact, the scene of the Book of Job is laid in Edom or Idumea, which is now, and always has been, a portion of Arabia, although in contact with Syria. The patriarch was in reality a powerful Arab sheik, or independent prince, in possession of sheep, camels, and asses, by thousands; and the mention of the sword and the "glittering spear," implying a knowledge of malleable iron, shows that his subjects were by no means such barbarians as were the Mexicans and Peruvians when first seen by Europeans. In the enumeration of the patriarch's stock, it will be seen that horses are not named. Most probably they were rare at the time, the mere luxury of the chieftains, and would no more be named than their wardrobe, or jewellery and trinkets.

In the passage I have quoted from the Book of Job, I have omitted that portion of the description of the horse which makes his neck to be "clothed in thunder." It is now considered to be a mistranslation, for it appears that the same word signifies in Hebrew "thunder," and a "horse's mane." The translation ought to have been "flowing mane." The interjection, "Ha! ha!" appears to be a mistake, for that simply expresses wonder or surprise, which is by no means consonant with the feeling attributed to the horse at the moment of action. It ought to have been "let us advance," or, "let us go on." These corrections of our version we owe to M. Ernest Renan, a distinguished French Orientalist, to whose translation of the Book of Job my attention was directed by my learned and accomplished friend the present Dean of St. Paul's, Dr. Milman.

For riding, the superiority of the horse over all other animals is unquestionable. The elephant, walking his only pace, will travel at the rate of four miles an hour, but it would distress him greatly to continue it for twenty miles. It would take him five hours to perform this journey, which the horse would perform in one hour, Of the domestic animals the dromedary, or common camel, is the one that, in speed, approaches the nearest to the horse, and its pace is probably equal to about one-half that of the horse. The messenger camel will travel, it is said, one hundred miles in twenty-four hours; but an English blood-horse has been known to perform a journey of double that distance within the same time. But in the case of the camel, the pace is "a killing" one, not to the animal, but to the man; for it is said that the life of the professional camel-driver, the Shuter-suwar of the Persians, does not exceed five years'.

The wild American tribes of the Pampas, Llanos, and Praries are all mounted. The chief force of the northern nations who conquered India, and held it in obedience from the eleventh to the eighteenth century, consisted of cavalry; and it was by its cavalry that the Mahrattas, one of the rudest nations of India, effected conquests which extended from Delhi to Calcutta and to Bombay, 1,000 miles east and south. In the middle ages of European history cavalry was the principal force, and the infantry little better than a hastily levied rabble. Fire-arms restored the infantry to its just position, and at present what with rifled small-arms and rifled cannon, to say nothing of Armstrong and Whitworth guns, which would mow down a cavalry when it was only visible with a spy-glass, an unsupported cavalry would be speedily annihilated.

Between the equipment of ancient and modern cavalry, there exists one striking difference worth notice. The ancients were ignorant of the stirrup. There is no name for it in classic Greek or Latin,—in Sanskrit, or in native Persian. There is, however, in Arabic, and this may lead to the belief that the Arabs were its inventors. In European record there is, indeed, no authentic account of the use of the stirrup before the seventh century, corresponding with the first of the Mahomedan era. At present there exists no people from "China to Peru" without it: and we find it difficult to understand how a trooper could maintain a firm seat, and make an effective use of sword or lance in its absence. The bridle, of course, was always used, and the celebrated Cuvier insists that our dominion over the horse depends on the toothless space for the insertion of the bit between the molar and canine teeth.

The Ass.—The ass, unlike the horse, is still found in the genuine wild state. Of the section of the *equidæ,* to which it belongs, there are ascertained to exist no fewer than five species, but hitherto it alone has been found amenable to domestication. The wild ass is a native of Asia only, and here not within the tropics, nor beyond the 40th degree of latitude, so that its genial climate is neither a sultry nor a cold one. It loves the desert and the unwooded mountains. By the care of man it has been very widely disseminated over the earth, with the exception of countries of rigorous cold, or those in which the horse is confined to the mere pony, which for labour is its substitute. Thus, it has not been introduced into Scandinavia, nor into the countries lying between India and China, nor into the islands of the Indian Archipelago, in all of which it is as much a stranger as is the camel in the same countries, or in Europe. It has been introduced into America, but has not multiplied there like the horse, that has resumed its wild state.

In the domestic state the ass, unlike the horse, varies but little, in size, form, or colour. The domestic ass, through neglect, is generally smaller than the wild one; but, for the most part, it bears in all respects a close resemblance—a fact from which it maybe concluded that there never existed more than one wild original; while of the horse there were probably many closely allied ones. The present domestic ass of Egypt is identical with that represented on the monuments of that country 4,000 years ago, as well as with the wild individuals in the gardens of the Zoological Society. The celebrated Cuvier, as before stated, says of the horse, that but for the space of bare gum between the cutting and grinding teeth giving room for the insertion and action of the bit, it never would have been subjected to the power of man; and the same remark applies to the ass, whose mouth, in this respect, differs from that of the horse only in being less sensitive.

The ass was, probably, domesticated earlier than the horse, in countries in which both were indigenous. At all events, it seems to have existed in greater numbers; a fact to be accounted for from its being more easily maintained and multiplied by a rude people. Thus, the patriarch Job had five hundred she or breeding asses, and no doubt a proportional number of males, the last alone probably used for labour; while there is no mention of the horse except in the well known beautiful poetical description of him already quoted.

The first domestication of the ass is commonly attributed to Egypt, but there is no good reason whatever for believing that it may not have been equally early in other countries in which it existed in the wild state, such as Syria, Persia, Arabia, India, Northern China, and parts of Tartary. It was soon introduced into Greece, no doubt from Egypt; and from Greece into Italy and Spain, but in Gaul and Germany it was not known in the time of Alexander, three hundred years before Christ; and it was very late indeed in reaching our own island, for it was rare in England in the reign of Elizabeth, and is scarce in Scotland even now. In Denmark, Sweden, and Norway it is still unknown as a domestic animal.

Language will help us in tracing the dissemination of the domestic ass. In every country in which it has been immemorially reduced to servitude, and in which it is indigenous, it will be found to have a distinct and peculiar name; whereas in countries into which it has been introduced, it has a foreign one. It has distinct names in Hebrew, in Arabic, in Persian, in Sanskrit, and in several of the vernacular languages of India. Thus, in Arabic the name is *hămar*, and in the cognate Hebrew *chamor*, possibly the same word. In Persian it is *khăr*, while in Sanskrit it has at least two names, *gardabha* and *khara*, the last of these being probably the same as the Persian word. The *gădha* of the Hindi, and *gădide* of the Telugu, are most likely corruptions of the first in order of the Sanskrit words above stated; but the Tamil word *kăludi*, which has been adopted by the Malays, abbreviated *kâldi*, is evidently a native word. But in all the languages of Europe it has but the one Latin name, and this taken from the Greek. In our own Celtic tongues, as in other European languages, its name is a corruption of the Latin one, while the sheep, the goat, the dog, and even the extinct bear and wolf have native ones.

The ass is said to attain its greatest perfection in Arabia, Persia, Syria, and Egypt, which may perhaps be in some measure attributable to these countries being its native and most congenial home; but is more probably owing to greater care in breeding and attention in breaking in, for the ass of India, where it is equally indigenous, but where it is grossly neglected, is even a more puny animal than in Europe. In India the burden of the ass is estimated at one hundred pounds, or the fourth part of that of the camel, and the eighth part of that of the elephant. It takes, of course, four asses to equal one camel, and eight to equal an elephant; but it is far hardier than either. A Chinese porter will carry a heavier load to a greater distance than the Indian ass, but this is owing to the superior skill of the human beast of burden in managing his load, and economizing his labour.

The Mule.—The mule, the unfertile offspring of the horse and ass, could, of course, not have been known until after the domestication of both its parents; for the unnatural union which gives rise to it never takes place except under the constraint of man. It is not found represented in any of the ancient monuments of Egypt, and is first named in Scripture in the time of Isaiah, close on five-and-thirty centuries ago. It partakes of the characters of both parents, having, to some extent, the hardihood and sure-footedness of the ass, and the size and strength of the horse. But it probably partakes most of the ass; a fact which would seem to be implied by the proportion of males to females, which is as three to one of the last to the first, a disparity in the sexes which never occurs when the parents are of the same species. All our European names for the mule are taken, with varions corruptions, from the Latin *mulus.* The Hebrew name is *pered,* and the Arab *băghăl.* The Sanskrit one is *aswastara,* of which, most probably, the Persian *astăr* is but a corruption. The Tamil is entirely different, namely, *kovaira.*

The finest mules are those of the South of France, where they are very frequent. In our own country, with its good roads and abundant food, and where varieties of the horse are reared adapted for every kind of service, mules receive little attention. In India, however, it is otherwise; for in a country so comparatively rude, they have the advantage of hardihood over the horse, of speed over the ox, and of speed and strength over the ass. For military purposes, therefore, they have of late been much employed. For carriages two mules are there considered as equal to one camel, while one mule is considered equal to two asses, the mule's load being two hundred pounds, which a French mule, in a good cart, on a good road, would multiply tenfold.

The Camel.—Exclusive of three small animals of the New World, the llama, the vicuña, and the alpaca, there are but two species of the camel family—the common one-humped, or dromedary, and the two-humped or Bactrian camel: and neither of these exist in the true wild state, although some have become feral. Both species are, by the structure of their feet and their constitution, natives of the dry open plain. The Bactrian is stronger, but slower,—of a colder region, and hence furnished with a longer and thicker coat of hair than the dromedary. With the exception of the boss, the two species much resemble each other, and are so closely allied that the issue of their union is fertile. They remain, however, perfectly distinct, and no advantage arises from their intermixture.

Confined, then, to two species, as is the case also with the elephant, we are not, as with the dog, horse, and ox, perplexed in tracing the origin of the camel. When or in what country it was first domesticated, it is of course impossible to ascertain ; but as it is limited by climate and locality, we are certain that its first domestication must have been by a people inhabiting countries congenial to it, and in which nature planted it. It was, assuredly, not in a mountainous country, nor in a hot and humid one, and in which its service would be of no use, that it was first subdued to servitude. We are then limited, for the domestication of the two-humped camels, to Tartary and the countries adjacent to it ; and for that of the single-humped to such countries as Arabia, Assyria, the southern provinces of Persia, and the northern of India. That it was independantly and separately domesticated by several different nations within its native *habitat*, is to be implied by its having a distinct name in each group of languages, but only a borrowed one in countries of which it could not have been a native.

Thus, in Hebrew, the name is *gamal*, and in the cognate Arabic *jâmal*, from one or other of which comes the Greek *camelos*, the source of the Latin *camelus*, turned in Italian into *camelo*, in Spanish into *camello*, and in French into *chameau*. In Sanskrit the camel is called *ushtăr*, which, there is little doubt, is the same word with the Persian *shutăr*. In Hindi, the chief language of Northern India, the name is *unt*. In the two principal languages of Southern India, the Telugu and Tamil, we have, in the first, *lotipito*, and in the last *wottai*, showing, as usual with these languages, little connexion with the Sanskrit.

It has been remarked that the camel is never represented on any of the ancient monuments of Egypt, on which the horse and ass are so frequent. It may, I think, be inferred from this that in Egypt, a country periodically inundated, it was not one of its usual domesticated animals, any more than it is now of the similar countries of Lower Bengal, Burma, or Siam. It could not, however, fail to have been very early known to the Egyptians, with Syria and Arabia in their immediate neighbourhood, Thus, in the Thirty-seventh chapter of Genesis a caravan of camels is represented as passing through Palestine, in its route from Arabia to Egypt : "a company of Ishmaelites came from Gilead, with their camels, bearing spicery, and balm, and myrrh, going to carry it down to Egypt." This was in the time of Jacob, and therefore, according to the usual chronology, 1800 years before the birth of Christ. Still earlier, indeed, the camel was known, even in Egypt itself; for among the gifts presented by Pharaoh to Abraham camels are enumerated; and this would carry us back to a time near 2000 years before the birth of Christ. Job, who was a powerful Arabian chieftain, possessed no fewer than 3000 camels.

But, although the camel be not among the many domestic and wild animals represented in the ancient monuments of Egypt, both the single and double-humped camel are very faithfully delineated on the monuments of Nineveh, which will take us back to at least one thousand years before Christ. It is nowhere represented, that I am aware, on any ancient Hindu monument, as are the ox, the buffalo, the elephant, and the horse; and the probability is, that it was introduced by the strangers who introduced Hinduism into Upper India—that people whose very name we do not know, but whom it has pleased some ethnologists of late to call Aryans.

The camel seems to have been unknown to the Romans, except as a curious stranger, and there is but a single or, at most, two representations of it on Roman monuments. The animal must, however, have been often seen by them in their wars with Parthians, Persians, and Arabs. In the first century of the Hejira it was brought by the Arabs into Northern Africa,—from thence into Spain, and the Spaniards have conveyed it to the Canary Islands and Southern America, countries in which it has no chance of superseding the more congenial and far more useful horse and ox.

In all the countries of the East congenial to it, the camel is the chief beast of burden, and, without it, the desert or sea of sand would not be effectually crossed. It has hence been called "the Ship of the Desert"; but "a boat", and a very small boat too, would be a more appropriate name for it than a ship. In India its average load is held to be about 400 pounds, one-half that of the elephant, and double that of the bullock, and its average pace is about the same as that of these two animals, namely, three miles an hour. When employed in draught its power is considered to be equal to that of two horses. In wet land it slips, slides, and falls, never to rise, and is, consequently, useless. It is, besides, of a tender constitution, and, when it falls off in condition from inadequate food, is of difficult recovery. Some 50,000 camels are believed to have perished in the Affghan war, which, at the moderate war-cost of £10 a head, would imply a loss of half a million sterling.

The camel is sometimes used to carry expresses; and it is stated that a trained camel, which requires also a trained rider, will travel one hundred miles in twenty-four hours. The pace is a long-trot, and, as already stated, a killing one to the rider, for it is said that the life of a camel messenger, the *shuter-suwar* of the Persians, does not exceed five years—most probably, however, an exaggeration. This achievement of the dromedary is far behind that of the English hack horse, which, in little more than forty hours, has travelled from London to York, a distance close on two hundred miles.

The flesh of the camel is legitimate food to the Arabs and other Mahommedan nations, but does not seem to be in much repute. Its hair was once used as a textile material, and from it was once made the fabric which, in Italian, is *ciambellino,* in French, *camelot,* and in English, camlet. Its use is now confined among civilized nations to the pencil of the painter.

The Llamas.—For food, for clothing, and for labour, the New World had, instead of the ten domesticated quadrupeds of the Old, but three small creatures of the camel family—the llama, the vicuña, and the alpaca—the strongest of which, the llama, is able to carry a load of no more than sixty-five pounds, which is hardly one-sixth part of the burden of the weakest of the camels of the Old World. The llama is unfit for draught, and hence it follows that the natives of America who possessed it could have had neither ploughs nor wheel carriages, without which any great progress in civilization would have been impossible.

Unlike the camels, which are denizens of the dry, open, level plain, the llamas are inhabitants of the mountains. The formation of the foot, which is constructed for climbing, proves this to be the case. They are still found in the true wild state on the Cordillera of the Andes, from Peru nearly to Tierra del Fuego, but never in the hot plains. They are, therefore, the denizens of cold mountain regions only. The hair of all the three species, known in commerce as alpaca, is of a fine quality, fit for textile purposes, and at present the animal is bred in Chili and Peru for its wool, which is largely exported. A few years back we began to import it into this country, and the quantity already imported yearly amounts to several millions of pounds. In the public returns I find it valued at 3s. a pound, while the finest sheep's wool of Saxony or Australia is worth but 2s., and that of Chili and Peru barely 1s. The value of its wool has induced some speculators to fancy that the animal might be acclimated in Australia, and experiments with this view have been made, but the want of a suitable climate and locality, that is, the absence of elevated mountain valleys and plateaux, such as those of its native region, seems to me to preclude the probability of success. The indifference of its flesh, compared with that of the sheep, will also be a serious obstacle. The llama, vicuña, and alpaca, all seemingly distinct species and in the wild state never intermixing, readily do, as before stated, in the domestic, to the production of a fertile offspring.

The Elephant.—There are of this remarkable animal two well-ascertained species only, the African and the Asiatic, but of the latter, at least, several varieties. The elephant is a native of intertropical and subtropical regions only, and the Asiatic not to be found in any country west of Hindustan, or further north than the 26th degree of latitude. The intertropical variety is superior in size and form to the subtropical one, and is of the greatest perfection in the eastern parts of Lower Bengal, in Burma, Siam, and Camboja. In a southerly direction, this variety extends to the Malayan peninsula and the island of Sumatra, but, with this last exception, is not found in any island of the Malayan Archipelago, for it is certain that a few lately discovered in a remote nook of Borneo are the descendants of imported ones run wild.

As to the names of an animal still existing in the wild state in many countries, they are hardly necessary for tracing its origin. All the natives in whose country it is indigenous have their own native names for it. In Sanskrit the principal names are *hasti* and *gaja*, from the first of which comes the Hindi *hati*, the most prevalent name throughout Hindustan. The second name extends to all the languages of the Malayan Archipelago. The proper Malay, however, has a native name, *beram*, rendered obsolete by the Sanskrit one. In the Telugu the name is *yenuga*, and in Tamil it is *ana*. The many nations inhabiting the countries lying between India and China have each its own distinct name for the elephant, as in Burmese, *sen;* in Peguan, *cheu;* in Karen, *kaso;* in Camboyan, *tamrai;* and in Siamese, *chang.* The Persian name is *fil*, and the Arabic *gashum* and *aishum.* The Greek *elephas*, of unknown derivation, is that which, with little change, has been adopted in all the languages of Europe.

The domesticated elephant in strict confinement refuses to multiply, but, turned loose into the fields, it does so as freely as common cattle. At the Burmese capital I saw herds of them with young of all ages, from a month up to three years old. The period of gestation of the elephant is about twenty months. At twenty years of age it obtains its full growth, and the duration of its life is about the same as that of man, or from seventy to eighty. When home-bred, the elephant is broken in, as we do colts, at eighteen months, but the operation is a far more difficult one. I saw it performed at the Burmese capital, when the little animal was almost as violent, and far more obstreperous, than a full-sized wild male, which I saw undergoing the same discipline a few days before in the same place. At whatever age broken in, the elephant is, for ever after, obedient to the master that subdues him. Chuny, the first elephant known to have been born with us in the domestic state, after receiving at Exeter Change more wounds than Julius Cæsar, is known to have knelt at the command of his keeper, before he received the *coup de grace.* A female elephant in Bengal, upon one occasion, escaped from confinement, and joined a wild herd. A long time after this a hunting party encountered a herd of wild elephants. In the party was the driver of the strayed elephant. He recognized her, called her by name; she obeyed, came to him, knelt, and he mounted her, and drove her home. I give this anecdote on the authority of the late Dr. Francis Buchanan Hamilton, an eminent naturalist, whom I had the pleasure of knowing, and who was a man that would certainly not have told the story unless he believed it.

The elephant in the domestic state sports very little in size or form, and not at all in colour, for the white elephant, extremely rare, is a mere Albino. I saw one of these at the Burmese, and several at the Siamese capital. There was nothing more remarkable about them than about a white buffalo, except that the one is rare and the other very common.

The height of a large elephant rises to 8 feet. Of one of 7 feet 4 inches high the weight was found to be 3,369 pounds avoirdupoise, which is about the weight of four fat bullocks in Smithfield market; or to give, perhaps, a more lively view of his bulk, the elephant in question weighed as much as a section of two-and-twenty grenadiers, every man of 11 stone; I include the commanding officer. The head alone weighed 450 pounds, and was, therefore, nearly equal in weight to three British grenadiers. The brain weighed 16½ pounds, equal to about six adult human brains. The brain of the elephant is, therefore, a very small one in proportion to the skull which contained it, and the huge body to which it belonged. Had it borne the same proportion to its body, as does the brain of man, which, usually, weighs 48 ounces, it ought to have weighed 72 pounds. I give the statement on the authority of a public report made to the Indian government by Mr. Gilchrist, of the Indian Medical Service, and as furnished to me by Lieut.-Colonel Anderson, of the Indian Artillery.

The elephant, as we all know, is a very sagacious animal; but the celebrated Cuvier gives it as his opinion (and I agree with him), that, in this respect, it in no manner excels the dog. It may even be doubted whether it surpasses the hog, an animal of the same natural family with itself, although the possession of the trunk, almost equivalent to a hand, enables it to make a greater display. It is naturally a very timid animal, and easily terrified by noise, and particularly by fire. A friend of mine, General Montgomery, of the Indian army, when shooting in the forests of

Pegu, was standing leaning against a tree, with his fowling-piece in his hand, when he heard behind him a rustling noise in the jungle. It was caused by a male elephant, "a rogue," so called, expelled from his herd. My friend felt certain of being crushed to death, but had the presence of mind to deal the infuriated animal a blow over the trunk with his gun. It shrieked, turned round, and fled faster than it had advanced. I had this from General Montgomery himself, as well as from his companion at the time, the late Dr. Wallich. In Cochin-China I saw an attempt made to make an elephant charge a *chevaux de frieze*, with some ignitable straw behind it. It was in vain, and the keeper was well scourged on the spot, because the sagacious animal declined deliberately to scorch his own proboscis. On the same occasion I saw a combat between an elephant and a tiger; but the tiger was muzzled, had his claws extracted, and was, besides, tethered to a post by the loins. He sprang, notwithstanding, at the elephant, which received him on his tusks, and pitched him to the distance of several yards, where he lay, helpless, fainting, and incapable of being roused to further effort.

The elephant is a bold but awkward-looking swimmer: the monster body is wholly immersed, and nothing visible but the tip of the trunk and a small part of the arch of the back. In this manner a whole herd will cross the Jumna or the Ganges without difficulty, and one is therefore surprised to find that Hannibal was obliged to construct a bridge of boats to enable his elephants to cross the comparatively narrow Rhone, and that the transport was an operation of difficulty. I was once myself present when the greater part of a force of some six thousand infantry, with its many camp followers, was transported across a broad torrent, a tributary of the Minor Chumbul, chiefly by elephants. Each elephant carried at a time about a dozen persons holding on by its harness. When, in such cases, the elephants became exhausted, they coolly disembarrassed themselves of their passengers by throwing themselves on their sides, then floating safely with the stream, and landing at their convenience. Such of the passengers as could not swim were, of course, drowned, and the number was considerable. This happened in 1804. The force was that of General Monson, retreating disastrously before the Mahratta chief Holkar, whom he declined to fight because he had but few European soldiers. In the Duke of Wellington's despatches there is an excellent account of the retreat in question, and of the causes which led to it. Had the duke himself commanded on the occasion, he certainly would have fought, and as surely beaten the Mahratta chieftain.

The first Europeans who saw the domesticated elephant must have been Alexander and his Greeks, when, about 327 years before the birth of Christ, they fought Porus in the modern Punjab, and defeated and captured some of his elephants. To the Asiatic nations west of India the elephant must have been well known long before this time, for we find a faithful delineation of one on the Nineveh monuments, which, according to Mr. Layard, will carry us back for a thousand years before Christ. Judging by the absence of so remarkable an animal as the elephant from the ancient monuments of Egypt, it is to be inferred that the animal must have been unknown to the early Egyptians, and hence to their cotemporaries the Jews.

When Pyrrhus, 281 years before the birth of Christ, invaded Italy, he had twenty elephants, the first ever encountered by the Romans. These must have been Indian, and as the invasion took place only forty-six years after Alexander's battle with Porus, and as Pyrrhus had, in the interim, conquered Macedon, it is not impossible but that some of the elephants in question may have been of those captured by Alexander on the Indus.

The African elephant, although specifically distinct from the Indian, in all probability possesses the same docility, sagacity, and capacity for servitude, yet it is remarkable that no Negro nation has ever tamed it, a proof of special incapacity in this race, seeing that this has been done by every Asiatic people in whose country the elephant is indigenous,—Burmese, Siamese, Cambogians, Tonguinese, people of the Malay peninsular, and even of Sumatra. An Asiatic people, however, the Carthaginians, had tamed and made use of the African elephant in their wars, for that their elephants were African and not Indian, is ascertained by a condition in the treaty which the Romans forced upon them 201 years before the birth of Christ, after the second Punic war. By that condition they became bound, says Livy, "to deliver up all the elephants they had tamed, and to forbear from taming more." Most probably the Carthaginians acquired the art of taming the animal from the Greeks, who of course learnt themselves from the Hindus. Both Greeks and Carthaginians probably employed Hindus in their management of the animal. This is to be inferred from the fact that the conductors of Hannibal's elephants, when he invaded Italy, are expressly stated by Livy to have been "Indians." One only wonders that the Romans should, at this time, have attached so much importance to the elephant, seeing that they had made cheap of those of Pyrrhus eighty years before.

The elephant has been used for burden, for riding, occasionally for draught, and, at one time, was used for war. In India, its average burden is reckoned to be eight hundred pounds, or equal to that of two camels or four oxen. Its average rate of travelling is about three miles an hour, and a march of fifteen miles is the utmost it can perform without exhaustion. Over the camel it has the advantage of travelling in wet lands and during periodical rains. Its employment, however, as a beast of burthen, is attended with many disadvantages, the first of which is the costliness of its keep. It always requires, in India, two attendants, and occasionally three. Its average annual consumption of corn (wheat for the upper provinces of India, and rice for the lower), is better than seven quarters a year, and the food must be baked or boiled. Its consumption of corn, then, is equal to that of seven human beings; but besides this, it has to be supplied with near forty tons of dry, and sixty-five of green fodder. The huge body of the elephant by no means exempts it from disease and accident. Its skin averaging in thickness from three-quarters of an inch to an inch, probably equal to that of four bullock hides, is very apt to be galled by its harness, and the galling is difficult to heal. An English or a Normandy horse will draw, on a good road, in cart or waggon, about twenty-two hundred-weights, performing with this load about twenty miles a day. Such a horse, therefore, is equal for carriage to three elephants, while the journey he performs is, by one-fourth, more. In a civilized country, with good roads and good draught horses, no one would think of employing the elephant, which is adapted only to a rude country, and this, too, only in a tropical or sub-tropical one.

For riding, the elephant is a very unpleasant and very unsatisfactory vehicle. Fortunately for the rider, its only pace is a walk, which for a spurt may be urged to five or six miles an hour, but does not ordinarily exceed four miles. The motion to the rider is severe—approaching perhaps to that of a carriage without springs, on, what our cousins across the Atlantic call a corduroy road.

An animal so timid and easily scared as the elephant never could have been of much value in war. It is formidable only to the eye from its bulk—a bulk, however, which makes it a conspicuous target for all kinds of missiles. Probably, in all times, elephants were at least as dangerous to their friends as to their enemies; and in action, since the invention of fire-arms, they have become worthless, for even the Indians have long discontinued their use. The last people that had recourse to them in warfare were the barbarous Burmese, in their first contest with ourselves. When attempts were made to charge our troops with them, both they and their guides were generally captured.

In the first encounter of the Romans with elephants, those animals, by their mere bulk and strange form, appear to have terrified both men and horses; but this bold and highly disciplined people soon became acquainted with their innate timidity, and especially with their dread of fire; and discharging at them ignited faggots of wood and other combustible matters, these readily put them to flight, which ended in throwing the columns of their own friends into disorder.

The elephant has been sometimes applied to draught, and in Ceylon, it has been ascertained that, on a good road, it will pull a ton and a half—a feat which a London dray horse will accomplish. It has been tried in India for the transport of heavy artillery, but has not answered. It is capable of a great momentary effort, but has probably too much intellect to persevere in a labour that is disagreeable to it. Sir Charles Napier tells us that in his army there was a favourite elephant that, when overloaded, always deliberately removed with its trunk the superfluous quantity.

The Africans make no other use of the elephant than to hunt it for its ivory, just as other rude people pursue the bear, the beaver, the fox, and the ermine, for their fur. Many of the tribes of inter-tropical Asia hunt the gigantic game for the same object; and among the civilized nations both of Europe, Asia, and America, there is a large consumption of ivory. Our own importations alone amount to little short of 10,000 cwts., of the value of £300,000. All this, of course, implies a great slaughter of the elephant. At the average weight of 150 pounds for a pair of tusks, our own importation alone implies the death of 8,000 elephants. This, however, does not perhaps imply a threatened extermination of the animal, for in Africa, for the most part, and in India always, it is the male only that has tusks, while a small number of males suffices for the herd.

Our sportsmen have of late years pursued the elephant with their accustomed zeal and intrepidity; and chiefly in Ceylon, where the chase can be followed without danger from lion or tiger, and where the animal is still numerous. In the course of his sojourn of several years in the island, one officer shot 1,200, and another Nimrod 700. Beyond satisfying the organ of destructiveness, and diminishing the number of its vermin, the slaughter serves no end, for the elephant of Ceylon, even the male, rarely has tusks, and the hide and carcase of the animal are of little value.

How congenial the soil and climate of Ceylon is to the elephant, may be judged by a fact recorded by Sir Emerson Tennent in his careful and instructive history of the Island: that in three years time, the number of 3,500 were killed for the reward offered by Government for their destruction.

The Sheep.—Naturalists seem to have come to the conclusion that the sheep no longer exists in the wild state. There is, however, a wild sheep called the Argali, which is found in flocks over the mountainous parts of Tartary, from Khamschatka westward, and another called the Moufflon, found in some countries of Southern Europe, as Crete and Corsica. These will pair with the domestic sheep to the production of a fertile offspring, and on this ground are considered to be the latter run wild; which seems, however, to be no more conclusive than a similar fact would be against the existence of wild asses or wild llamas.

In form and size the sheep, in the domestic state, is of nearly as many varieties as the horse or ox; but in colour, it sports only from white to black. One singular variety is found from the western border of India, to Syria, and which has reached Africa, as far south as the Cape of Good Hope. This has a huge, heart-shaped tail, composed almost wholly of fat, which has been known to weigh occasionally as much as fifteen and twenty pounds.

The sheep has been as long domesticated as the ox, the horse, or the ass. On the most ancient of the monuments of Egypt, it is frequently represented, both horned and hornless. This will carry us back some four thousand years. In holy writ, it is mentioned as a domestic animal existing in flocks almost from the account given of the creation of man. In the Assyrian monuments, we find it horned and hornless; but neither in these nor the Egyptian do we find the fat-tailed variety, possibly not from its non-existence, but from its unseemliness for representation. In the pile villages of the Swiss lakes, there were found the bones of a small species of sheep, pronounced by the Swiss naturalists to be those of a domestic breed, a fact which, if true, would make the domestication of the sheep older in Europe than in Egypt or Assyria.

The sheep, as soon as man had acquired such a measure of civilization, as to have subdued the ordinary domestic animals, must have formed the chief source of his animal diet, since the flesh of the ox, the ass, and the horse would have been less available, from the greater difficulty of rearing these animals, and their value for labour. Its wool has immemorially constituted the chief clothing of the inhabitants of the old world, wherever there is a distinct winter. This clothing was first naturally in the form of the mere fleece. Then it was used as felt, as we find it still in the Tartar tent. Next it was woven into serge, which was its form in the toga of the Roman senator, the purple robe of the emperor, and finally it became broad-cloth in very modern times.

Most countries of the old world were immemorially in possession of the sheep. Our own, it is believed, had it not until introduced by the Romans, for among his enumeration of the domesticated animals of our island, it is not mentioned by Cæsar. Two thousand years ago, therefore, if this were the case, we were worse clothed than are now the Calmuck Tartars. The mere silence of Cæsar, however, it may be suspected, is not conclusive of the absence of the sheep in Britain in his time, for in our Celtic dialects we find distinct names, not traceable to any foreign language, for the sheep, the ram, the wedder, the lamb, and wool. The sheep was wanting, like the ox and horse, over the whole American continent and its islands, and was conveyed to them by Europeans within the last three centuries and a half, and it has there flourished, although, from its becoming easily the prey of ferocious animals, by no means in the same degree as the horse and ox. We have ourselves conveyed it to Australia and to New Zealand, where, although in these countries there existed no creature of the family to which it belongs, it has thriven as well,—indeed better than in countries in which it was indigenous, owing to peculiar adaptation of soil, climate, and food, together with the absence of all wild animals, saving the dog, to prey on it.

The sheep, as the quality of its coat plainly implies, is a native of cold and temperate regions. It thrives in high latitudes, as far as it can obtain its natural food, the grasses, and will multiply, although it degenerates, within the tropics. Many varieties of it are bred in Hindoostan. That of lower Bengal does not weigh more than a Leicester lamb of six weeks old. I have seen one of the huge cranes, popularly called adjutants, bolt the leg of one without much effort. Through most of the provinces of Madras there are several distinct breeds, one of which is not easily distinguished from a goat. These have a short and coarse fleece, the wool of which is spun and wove into a coarse cloth. The sheep, introduced, as its Indian name implies, by the Hindus, is bred at Achin in Sumatra, six degrees north of the equator, and in Java, about the same distance south of it, but very partially in both cases.

In every original tongue of the nations that have immemorially domesticated the sheep, not only a native generic name will be found for it, but generally specific ones, according to age and sex. As generic names, we have in Greek, *ovis;* and Latin the same word, as well as *pecus;* in Hebrew, *rachal;* in Arabic, *shot;* in Sanskrit, *mésha;* the Persian being the same word with the last vowel elided; in Telugu, *gora;* in Tamil, *adu;* and in Hindi, *beri;* by which last name it is known to the Malays and Javanese, with whom it is an exotic. Conveyed as a stranger to the New World, it is the sheep of the Anglo-Saxons, and *oveja* of the Spaniards. In Australia it is the sheep only, for here we have no rivals; while among the Polynesian islanders, the same word, from incapacity of pronunciation, is corrupted into *hipa.*

It is needless to insist on the extent to which the sheep, by furnishing man with food and clothing, has contributed to his civilization. Without the sheep Cicero must have delivered his orations—if we can imagine a savage Cicero to have had any orations to deliver—in a bear or a wolf skin; and if Augustus Cæsar had a shirt at all (Dr. Arbuthnot says he "had not a shirt to his back") it must have been woollen, a kind of rude flannel waistcoat at the very best.

To every man and woman, without the tropics and up to the Arctic Circle, the sheep is indispensable; but it is perhaps more eminently useful to ourselves than to any other people; and a few familiar facts may be stated to show its vast importance. The number of sheep in the United Kingdom has been estimated at about 40,000,000; but not content with this, we are yearly importing for the shambles near 200,000. Reckoning a fleece at no more than three pounds, our annual production of wool will amount to 120,000,000 of pounds, that is, from 50,000 to 60,000 tons weight, of not less value than £6,000,000 sterling. But we import wool, and of a better quality than our own, to the extent of 124,000,000 of pounds, of the value of between £8,000,000 and £9,000,000. Some seventy years ago, we transported some of our burglars and homicides to a certain part of the antipodes, so as to place them as far away from ourselves as possible, and without the smallest expectation of wool. Those once penal settlements now furnish us with above 50,000,000 of pounds of wool, a good deal better in quality than our own, and equal in value to more than one-half of that of all that we import. The same land that was found good for sheep was, about ten years ago, found to be very prolific in gold, which it now yields to near thrice the value of the wool. Much evil to wool was anticipated from this gold, especially by certain prophetic statesmen. But the anticipated evil has turned out to be a positive good, for the wool has increased in quantity, without suffering any deterioration in quality.

The Goat.—This animal, far less valuable than the sheep, has been as long domesticated, for it has repeatedly figured on the Egyptian and Assyrian monuments in flocks attended by herds, and it is mentioned in Scripture as among the flesh which was lawful food. It is a far hardier animal than the sheep, living on coarser food, and in a greater variety of climate, for it is found in the domestic state from the equator up to 60 degrees of latitude.

Attempts have been made to trace the domesticated goat to a single wild species; but the great probability is that it had its origin in several closely allied species, capable, under the dominion of man, of pairing and producing a fruitful offspring. Several of these wild species still exist in eastern Europe, in the mountains of Persia, and in the Himalayas, capable, as far as the experiment has been tried, of producing a fertile offspring with the domestic goat. In ancient times a wild goat existed in some countries, in which it is no longer found. Thus, the wild goat is described, along with several species of deer, as among the animals the flesh of which was to be deemed lawful food to the Jews, but in the wild state the goat no longer exists in Palestine.

The goat admits of a vast variety as to size, form, and colour. Thus, India produces the largest and the smallest breeds, that of the countries lying west of the river Jumna, and that of Bengal proper, the first of which stands three feet high, while the latter is a pigmy, but a very prolific one, which has been seen to produce six kids at a birth.

For all but its milk—for the flesh of the kid is equal to that of the lamb, and for facility of rearing and maintaining—the goat is far inferior to the sheep. The flesh of the full-grown animal is hard and flavourless, and the ordinary hair is of small value. The inner hair only of one variety is valuable, that of the Tibet, for it is the raw material of the beautiful and inimitable shawls of Cashmere. It is a tegument which nature furnishes, although not all equally fine in quality, for the protection of all the mammalia of a country at once of extreme cold and extreme drought—qualities combined in the plateau of Tibet, the native country of the shawl goat. There is no such country in any other part of the world, and hence the improbability of producing shawl wool beyond it. This I state on the high authority of my friend, the distinguished naturalist, Dr. Falconer.

The many distinct names for the goat in many languages are proof that, like most of the domesticated mammalia, it was brought under the power of man at many separate and independent points. Thus, we have the Greek, *tragos;* the Latin, *caper;* the Hebrew and Arabic, *tayish ;* the Persian, *băzăr ;* the Sanskrit, *chhaga* and *aja ;* the Hindi, *băkra ;* the Telugu, *méka ;* the Tamil, *velladu ;* the Malay, *kambing ;* and the Javanese, *mendé.* In that isolated language, the Basque, we have, of course, a peculiar name for the goat, *auntza.*

The goat is of high value in the early stages of civilization, and in countries unfit for the rearing of the sheep, and this chiefly for the facility with which it is maintained, and the abundance of its milk. It is still a frequent stock in Spain, Italy, Syria, Persia, and India, but has nearly disappeared in France, Germany, and Britain, and is unknown in the most populous parts of China. It disappears, in short, with the advance of population and cultivation. It was unknown to America and to Australia, and the islands of the Pacific Ocean, to all of which it was conveyed by civilized European man within the last three centuries and a half.

The Hog.—There are not fewer than eleven species of hog in the wild state—one peculiar to Europe, two to Africa, six to Asia, and two to America ; yet out of this number one only has been domesticated, and what that one is has as yet not been satisfactorily determined, for much doubt has lately been thrown on its being the wild boar of Europe. In the Pile villages of the Swiss lakes naturalists found the bones of two wild species, those of the common wild hog, and of another species, which they have called the *Sus palustris.*

The hog thrives in every climate in which it can find food, from the Equator up to the 60th degree of latitude. We find it represented on the oldest Egyptian monuments, and it is early mentioned in the Bible.

The hog is valuable only for its flesh, its skin, and its bristles. It has formed a large portion of the animal diet of all the nations of Europe, ancient and modern. It is the chief animal diet of China, of all the countries near it, and of Japan ; but by certain nations of Asia or Africa its flesh has long been held in abomination. This was the case with the ancient Egyptians, with the Jews, and with all the people that have adopted the Mahommedan religion. The prejudice has clearly arisen from the omnivorous character of the hog, and its consequent filthy habits when neglected ; for, both in the wild state and when supplied with wholesome food, it is, although a voracious, a nice and discriminate feeder. That the prejudice against it did not always obtain among the nations that now entertain it, is obvious, from our finding the domestic hog among all their descendants, although degraded like the dog to the condition of a common scavenger. Such, it is evident, could not have been the case, when men went to the trouble of taming, domesticating, and breeding the animal. This is further corroborated by our finding that, among the castes of Hindus to whom flesh is lawful food, the flesh of the wild hog is eaten like that of deer, or any other game. In the early stages of society the flesh of the hog was, most likely, the principal diet of all the people among whom the wild hog existed ; and it was probably not abstained from until other domestic animals became abundant. The first people who abstained from it were the Egyptians, and from them the Jews most probably imbibed the prejudice, while from these last the Mahommedan nations have embraced it, raising it to the dignity of a religious dogma. Most of the people of the Malayan Archipelago have adopted the Mahommedan religion, and, of course, abstain from the flesh of the hog ; but among the rude nations who have not done so—such as those of the Malay peninsula, Sumatra, and Borneo—the flesh of the hog is the chief animal diet, and their partiality for it has, in fact, proved the greatest obstacle to their adoption of Mahommedanism.

The domestic hog has followed the migrations of man, but the time and manner in which it has done so are matters which belong only to very recent history, as in the case of its transfer to America and its islands, and to Australia and New Zealand, in none of which did it exist, until introduced by Europeans. Captain Cook introduced hogs into New Zealand, and, according to a recent writer, " The whole country is now overrun by them, in a wild state ; and in the deep recesses of the forests they have lost the appearance of domestic pigs, and have assumed the habits and the colour of wild animals."* But we find hogs in most of the islands of the Malay Archipelago, in which the wild hog of Europe and Continental Asia does not exist. Thus Java has two distinct species of wild hog, but neither of them has been domesticated. Several of the islands of the Pacific possessed the domestic hog, but how it got to them is a mystery, for they have no wild hog of their own, and, by the evidence of language, they are not traceable to the Malayan islands, like their numerals and the names of some cultivated plants.

The hog is represented in the earlier monuments of Egypt, and early mentioned in holy writ. Its first domestication, like that of all the other domestic animals, is buried in the depths of rude and remote antiquity; but, as the animal still exists in the wild state in most of the countries of the Old World, there can be little doubt but that it was effected at many separate and independent points. This would seem to be corroborated by the great number of different names which it has in different languages. Thus, we have *choiros* and *porkos* in Greek, *sus* in Latin, *sau* in German, *muc* in Erse, *kănsir* in Arabic, *khauk* in Persian, *sukara* in Sanskrit, *puni* in Tamil, *panda* in Telugu, *babi* in Malay, *cheleng* in Javanese, *badul* in Sunda, *püaka* in Polynesian, and *kisüa* in Madagascar. The *cochon* of the French and the *cerdo* of the Spanish, not traceable to any foreign tongues, may possibly be words of some extinct languages.

Some of these words, either as belonging to cognate tongues, or without being so, communicated through the intercourse of nations, have had a very wide dissemination, sometimes as the sole term, but often only as synonymes. In this manner the Greek *porkos* has extended to the Latin, and all its derivative tongues, and, through the Norman-French, even reached our own language. The Hebrew *kăsir* is evidently the same as the Arabic *kănsir*, and the Hindi *süar* but a corruption of the Sanskrit *sukara.* The German *sau* is our own *sow*, and, in one form or another, this name is to be found in all the Teutonic languages. The Malay word *babi* is to be found in almost every tongue, from Sumatra to the remotest of the Philippines, in the various forms of *bawi, baboi, babüi, wawi,* and *fahi.*

In the Polynesian dialects the name for the hog seems to be peculiar and indigenous, and appears in the various forms of *püaka,*

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* Story of New Zealand, by Arthur S. Thomson, M.D., 1859.

puăa, and *büaka;* and the same observation applies to the language of Madagascar, in which we have it as *kisüa.*

The Rabbit.—The tame rabbit is not only the sole animal of the family of "hares," but the sole one of the numerous class of rodents that has been domesticated, unless, indeed, we except the worthless Guinea-pig, a native of Brazil. There are, no doubt, other rodents which might be so were it worth while—as, for example, the gregarious and sagacious rat, which, to our much annoyance, almost forces itself into domesticity, and which, but for our own presence, would not have existed in the vast numbers it does.

The rabbit is considered to be a native of Spain and of Northern Africa, on the shore of the Mediterranean, where the Spanish army, in its late campaign, found it abundantly in the wild state. As a domesticated animal, it was familiar to the Romans, and is often mentioned by their classic writers. Through their agency it was disseminated over all their conquests; and modern Europeans have spread it over all the temperate and warm regions of Asia and America. This wide diffusion it owes to its extraordinary fecundity, and to the facility with which it is acclimated. It is the only animal which in Europe has run wild from the domestic state; but I am not aware that it has anywhere done so in Asia or America, probably from having too many enemies to contend with.

The rabbit, whether wild or domestic, is unknown to the oriental nations, except as connected with Europeans, for the animal rendered coney by our translators of the Scriptures, the *Hyrax Syriacus,* is well known to belong to a wholly different family. The Latin name of the rabbit, from whatever source derived, has had a very wide currency, for from it, although much disfigured, are undoubtedly derived the Italian *cognilio,* the French *conil,* the Spanish *conejo,* the Portuguese *coelho,* the German *konil,* and the English coney. From the Portuguese name come the Malay ones, *kuwelu* and *târwelu.* Our own most familiar name is, as far as I know, not traceable, and such is the case with the usual French name.

Of the rabbit being a native of Spain, or, at least, very long domesticated in that country, its having a specific name in the Basque may be adduced as evidence. That name is *unchia,* a word not traceable to any other tongue; but it has also as a synonyme *conejüa,* a corruption of the Spanish word.

In England we rank the rabbit with poultry, and, if we except the common fowl, it has probably yielded more sustenance to man, in so far as European nations are concerned, than any other kind of it.

The Rein-deer.—This animal, the only one of the deer family that has been, strictly speaking, domesticated, is found in the wild state in Europe, Asia, and America,—northward as far as the sixtieth degree of latitude. In Europe the Baltic Sea is its southern limit. In the southern hemisphere it is unknown. It is in Europe and Asia alone that it has been reduced to servitude, for the red man has never achieved this feat. In the regions in which it is domesticated it is used for food, for labour, and for clothing, and is, at once, the substitute for the ox, the horse, even the sheep, and without its assistance the people who possess it would be wandering or comfortless savages—for no other animal of equal utility could exist in the countries for which it is specially fitted.

The flesh of the rein-deer is much inferior to that of the ox, and the milk of the female but trifling in quantity. Its average burden in a sledge, over the ice or frozen snow, is about 240 pounds, and its speed about eight miles an hour. The load, then, is but one-third more than an Esquimaux dog will draw, and the speed is nearly the same.

The Cat.—Among the vast number of species of the feline family the house-cat is the only one that has been domesticated. Naturalists have not agreed on its wild prototype, but considering that the domestic animal exists in many seemingly independent and unconnected parts of the old world, ranging from Europe to Japan, the great probability is that it has sprung from several closely allied species, capable, by intermixture, of producing a fertile offspring. This seems the more probable, when we advert to the great variety which exists in the domestic cat among the different people who possess it. The cat of Persia has a long bushy tail, and a fine fur. That of Hindustan does not materially differ from that of Europe; while the Burmese, the Siamese, and the Malay cat has a tail of less than one half the usual length, terminating abruptly in a hook.

Although the wild original of any variety of the domestic cat cannot be satisfactorily determined, several wild species exist which very closely resemble some of them. That the wild cat of Europe, however, is not the source of our house-cat may, I think, be inferred, from its being superior in size to the latter, a fact which is in opposition to what is known to be case with other animals, as in the instances of the goose, the mallard, the rabbit, and even the ass, when duly cared for.

The many distinct names for the domestic cat, in different languages, would seem to support the hypothesis of many separate origins. In classic Greek the name for it is *aiguros,* and in low Greek *cattus.* In classic Latin we have *felis,* and in middle-age Latin, from the corresponding Greek, *catos*, from which come all the names in the modern European languages, whether Italian, Celtic, or Teutonic, such as the Italian *gatto*, the Spanish *gato*, the French *chat*, the Erse *cat*, the German *katze*, and the Danish *kat*. This is indeed the sole name in all the spoken languages of Europe. Even the Basque, which has native names for the other familiar domestic animals, has the Latin one, in the form of *catüà*. It must, I think, be considered that in the western countries of Europe the domestic cat is an exotic, and also a corroboration of the assertion that the European wild cat was not in this case its prototype.

In Egypt the cat was early domesticated, for we find it represented on the most ancient monuments, and even mummies of it existing of equal antiquity. In Hebrew, I believe, there is no name for the domestic cat, for the Jews do not appear to have carried it with them from Egypt to the Holy Land. Indeed, to a pastoral people, who did not, like the Egyptians, consider it a sacred animal, it would have been but an incumbrance in the Desert. The Arabs, however, have two names for the cat, *sânur* and *hir*. Its Persian name, *gurbah*, is apparently an isolated one. In Sanskrit we find no fewer than three names for it, *mano*, *manjar*, and *bila* and *bili* respectively, for the male and female. The last of these has been adopted by the Hindi. In the Southern Tamil we have a wholly different name, *puni*.

In Malay and in Javanese the domestic cat is called *kuching*, a word never applied to any other of the many wild feline animals of the Malayan country. It extends to several other languages than the two named—even indeed a little corrupted to the Philippine languages. It is, however, not the only name for the cat in the languages of the Malay Archipelago, for in one of those of the island of Timur it is called *bavah*, and in the languages of Celibes it is *meáü*, an obvious imitation of the cry of the animal.

No feline animal of the New World had been domesticated, and Australia and the islands of the Pacific Ocean had none to try the experiment on. Europeans, however, have introduced the cat into all these countries.

For the utility of the cat to man not much can be alleged. Its fur is of small value, and its flesh of less, the Chinese being the only people that at all use it. Even its service in keeping mice and rats within bounds is rather questionable.

BIRDS.

The domesticated birds, although they no doubt combine a greater number of original species, are in all, as we find them, no more than nine in number, namely, the common fowl, the guinea fowl, the pheasant, the peacock, the turkey, the pigeon, the duck, the goose, and the swan. I shall consider them in this order.

The Common Fowl.—Of all our domesticated birds, incomparably the most important is the common fowl. This bird, the *gallus bankiva* of naturalists, still exists abundantly in the wild state in most of the warm and temperate regions of the continent of Asia, and of the islands adjacent to it; but even here limited to Hindustan and China, with the countries between them, with the adjacent Philippine and Malayan Archipelagos, and not extending further than the thirtieth degree of north, or the seventh of south latitude. I have myself seen the wild birds in the woods of Upper Hindustan, of Burma, of Cochin China, and of Java, and can testify to their entire resemblance in note and plumage to some of the most ordinary varieties of our domestic poultry, being only smaller in size.

The domestic fowl is at present widely disseminated over the whole civilized and even uncivilized world, and this in countless variety as to size and colour. This wide diffusion it owes to the hardihood of its constitution, its fecundity, and the excellence of its flesh and eggs. Where or by whom it was first domesticated it would be vain to inquire, for no doubt it happened in rude times and remote ages. It is certain, however, that its first domestication must have been effected within the limits of the region in which it still exists in the wild state, and beyond which it has never been found so existing. Within that wide region, too, it is fair to conclude that its domestication was effected at many different and independent points.

As the common fowl, in the wild state, does not exist in any country west of Hindustan,* and as there is no reason to believe that it ever did so exist, it must be concluded that in the domestic state it was introduced into these by man. For this introduction there is at least negative evidence; and it is remarkable that this is within the historic epoch, which can hardly be said of any other of our poultry except the Turkey, and perhaps the Guinea fowl. It is never named in the Old Testament; and, indeed, the Jews had no domesticated bird, unless the pigeon, and even that is uncertain. This brings us down to the seventh and eighth centuries, before the birth of Christ. In the Homeric Poems there is no allusion to the common fowl.

The high probability is that Central and Western Asia, with Europe, secured it through Persia; and the Greeks, indeed, sometimes called it "the Persian fowl." The western countries would naturally receive it from the place nearest to them, and with which they had most communication, and this was Northern

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* Pottinger, in his Travels, says incidentally, that the chiefs in Western Beloochistan hawk the jungal fowl.

India, which may, therefore, be considered the parent country of the domestic fowl of the Western World. We have, indeed, some indications of its progress westward. It is represented on the monuments of Nineveh, and was, therefore, known to the Assyrians before the destruction of that city. It is also represented on the Syrian monuments. These facts have been pointed out to me by my friends Mr. Layard and the late Sir Charles Fellowes. The earliest mention of the common fowl in Greek literature is in the poems of Theognis, an author that died at an advanced age, after the battle of Marathon, fought 490 years before Christ. At this time the Persians were at one and the same time in possession of the Asiatic colonies of Greece, and of some provinces of Hindustan, and must, therefore, have possessed the bird, which it must be presumed the Hindus had immemorially domesticated. I state this on the authority of an accomplished Greek scholar, my friend the Hon. Edward Twistleton. In possession of it, the Greeks, through their colonies, would, of course, introduce it into Italy and Gaul, and from Gaul it would reach Britain, where Cæsar found it near 2,000 years ago. Its early introduction into Italy is shown by faithful representations of it on Etruscan monuments. It is also figured on the coins of the Samothracians and of Thirnesa, which carries us back to six centuries before the birth of Christ.

The common fowl, whether in the wild or domestic state, was wholly unknown on the continent and islands of America; and its introduction into them, therefore, goes no further back than the time of Columbus' first voyage. It was equally unknown on the Australian continent, into which we ourselves introduced it only seventy years ago. It was found by European navigators, in several of the islands of the Pacific Ocean, but when or how introduced is wholly unknown. In these it does not exist in the wild state, nor is the name given to it traceable to any foreign language, as is the case with some of their most useful plants. New Zealand, however, was not one of these, for the common fowl was first introduced there by Captain Cook, about ninety years ago, and so congenial are the soil and climate, and so few its enemies, that in some localities it has already resumed its wild state.

In attempting to trace the history of the domestic fowl, language affords us some assistance, but less than might have been expected. In the languages of countries in which the bird is an exotic its name, for the most part, is but the generic one for the feathered tribe, with some epithet to distinguish it. This is the case in our own language, when we talk of the common fowl, the dunghill fowl, the domestic fowl, the game fowl, and the like. Such, too, seems to be the case in the other Teutonic languages; and even in the Persian the name is simply that of "fowl" in general, with an epithet signifying "domestic." There is, however, one well-known exception in the word *gallus* in Latin, borrowed, with the customary modifications, in its derivative tongues, the Italian and Spanish. The word is the same as that for a man of Gaul; and, indeed, to distinguish them, the Romans sometimes used for the former the epithet *gallinaceous*. I believe that the etymology of the word has not been traced; and I throw it out as a conjecture that the bird may have been first made known to the Romans through the Greek colony of Marseilles, founded about the time, 600 years before Christ, when the bird is ascertained to have become known to the Greeks. If this were really the origin of the word, the mistake of the Romans would be like our own, when we call our dwarf breed *bantams*, because we first saw them in the kingdom of Bantam, in the island of Java, to which they had been brought by native junks from Japan, their native country. It would not at all equal the blunder by which we call a bird of America, known to us only in very modern times, a *turkey*. Had the word *gallus* come direct, like many others in the Latin language, from Greece, it would have borne, we may presume, the usual Greek name of *alectryon.*

In the languages of some countries of which the fowl is not a native its name would seem to have a figurative sense, derived from its character or habits. Thus, in Arabic its name is *dăjajăt,* which also signifies "domestics" and family." In Greek the name is *alectryon,* which (I again quote Mr. Twistleton) would seem to have some relation to the word *alectron,* "bedless" or "sleepless", referring to the watchful character of the bird.

In the languages, however, of countries in which the bird is indigenous it seems generally to have a specific name. Thus, in Sanskrit it is *kukuta;* in the Tamil, *ilori;* in Burmese, *kret* or *kyht;* in Malay, *ayam;* and in Javanese, *pitik.* In the Philippine tongues we have one name for the wild bird, *labuya;* and another, *manuk,* for the domestic. The last of these words has a wide extension, for we find it in all the dialects extending from Java up to the Philippines. In the Javanese language it is the common term for bird or fowl, and in so far as the Philippines are concerned this would seem to imply that, although the common fowl existed in these islands in the wild state, the native inhabitants had not learnt to tame it, and that in the domestic state it was made known to them by the Javanese. These Philippine islanders now, however, occasionally tame the wild bird, for I find that they occasionally use it in cock-fighting.

In the Polynesian language, so widely spread over the islands of the Pacific, the name for the common fowl in the domestic state (for, as already stated, it does not exist in the wild) is *möa,* while, strange enough, the generic name for bird or fowl is the Javanese one already quoted, *manuk,* the final consonant, from the necessity of the language, being *elided.* When the tropical islanders of the Pacific migrated to New Zealand they took with them the dog and the rat, but not the hog or common fowl, the only other domestic animals which, when first seen by Europeans, they possessed. When the colonists arrived in their new home, strange to them by its climate and productions, we may readily fancy that when they saw those strange, almost wingless, and ostrich-like birds which are there the substitute for quadrupeds, bearing some resemblance to the domestic fowl which they had left behind them, they gave them the same name, namely, *möa,* which is that which European naturalists suppose to be the specific name of the Struthian birds in question.

It would be superfluous to insist on the benefit which civilized man has derived from the domestication of the common fowl. This benefit it has been conferring on the nations of the old Western World for now 2,500 years, and must have done so on several of the nations of the East for a far longer time. The Hindus are the only existing people who think their flesh unlawful food. It would appear indeed, from Cæsar's account of the manners of our forefathers, that in this respect they were no better than Hindus, the food of pullets and geese being forbidden food with them. There is certainly not a remnant of this prejudice among us now, for we are, the French excepted, probably the greatest consumers of pullets and their eggs in the world.

The perfection of the domestic fowl depends on care in breeding, on soil and on climate. It might be presumed that, when carefully reared, it would attain the highest perfection in those countries of which it is a native. There are none worse, however, than the fowls of Hindustan generally; but this evidently results from sheer neglect, and there are facts to prove that such is really the case. The game fowl of India is superior in size and strength and equal in courage to that of England, the latter, indeed, being no match for it in the cockpit. In one province, of Bengal Chittagong, a very fine breed, remarkable for its size, is reared, but this is supposed to have been the work of Portuguese settlers long established on its coast. In China much attention is paid to the rearing of the domestic fowl, and some large breeds are produced. I presume that the fowl which has of late years been introduced into this country, under the name of Cochin-Chinese, is really from Shanghai in the Chinese province of Kiangnan. I am at all events certain that it is not from Cochin-China, for after visiting three different parts of that country, I saw no breed resembling it. The breed which I did see was certainly a very fine one, much resembling our own game breed.

There is one use, or rather abuse, of the domestic fowl, to which I must refer. The pugnacity and courage of the males, qualities implanted by nature, seemingly to prevent the race from degenerating, have been taken advantage of, and their combats have been favourite sports with many nations, among whom we were ourselves once distinquished. I imagine this kind of amusement must have been almost coeval with the domestication of the cock. In the fresco painting of an Etruscan tomb in the Gregorian Museum of the Vatican, there is the representation of two men facing each other, and each holding a cock, evidently prepared to set them down to fight. Cæsar tells us that the Britons kept the domestic fowl for their diversion and pleasure, "animi voluptatisque causa," which may probably mean that they reared them for cock-fighting, and if so, the amusement is of venerable antiquity with us.

Cock-fighting as a sport is unknown to the Chinese and Hindus, but is, or was, a favourite pastime of the Mahomedans of Hindustan, and hence the superior game breed to which I have above alluded. The Malays, but not the Javanese, have always been great cock-fighters, and I found the natives of the populous island of Bali, notwithstanding their Hinduism, to be so also. In the Malay language there is a specific name for the comb of the cock, for his wattles, for his natural spur, for his artificial spur (a miniature two-edged dagger), for his conflict, and for the cockpit. But it is among the Philippine islanders that the passion for cock-fighting is most pervading. The nomenclature connected with the cock is as copious as the Malay one, while in the principal language of the chief island, there are besides specific names for no fewer than nine different varieties of the fighting cock. A Spanish writer, Buzeta, quoted by my friend Sir John Bowring, makes the following, among other remarks, on this absorbing amusement of the Philippine islanders: "The Indians have an inveterate passion for the sport, which occupies the first place in their amusements. The cock is the first object of their care, their general companion, that accompanies them even to the church door, and is fastened to a bamboo stake when they enter for the service of the mass. For no money will they dispose of a favourite bird. Some possess as many as half a dozen of these inappreciable treasures, for whose service they seem principally to live."

The Gallini.—Of this well-known bird there are no fewer than eight species, of which only one has been domesticated. The domestic differs but little from the wild bird in form, size, or plumage. It seeks the bush in breeding, never loses wholly the power of flight, perches in trees, and, in fact, never acquires the same amount of domestication as our ordinary poultry. The gallini is a native of the tropical and sub-tropical parts of Northern Africa. It was known to the Romans under the name of Meleagnis and the "Numidian bird" pointing at the locality from which they derived it. It was no doubt first domesticated by the Numidians and other brown, but not by Negro races of Northern Africa, and if so, it was, with the exception of the goose in Egypt, the only bird ever domesticated by an African people. We may, indeed, conclude that the Romans received the Gallini from the Numidians, in the same manner that the Spaniards received the Turkey from the Mexicans, that is, when already domesticated.

Pennant, in the 71st vol. of the *Philosophical Transactions*, states that "Guinea hens," or Gallinæ Africanæ, had been long imported into England, and that in 1277 they were bred in the farm-yards of Buckinghamshire, but that, in consequence of the difficulty of rearing them, their breeding was discontinued. They were, at least, extremely rare down to the middle of the seventeenth century.

The Guinea fowl, now widely diffused over Europe, has been conveyed by European emigrants to their settlements in Asia and America, and in some places, as for example in Jamaica, it has resumed its wild state, and is shot as game in the forests.

The Pheasant.—The pheasants are very numerous, being reckoned at no fewer than twenty. They are found in most countries from the equator up to the 40th degree of latitude, but the Guinea fowls excepted, are confined to Asia and its islands. Three of them only have been not domesticated, but naturalized only in foreign countries, the common pheasant, the silver, and the golden, but the domestication is a very imperfect one, for they are always more or less wild, and, when naturalized, undergo little or no change in form or colour.

The common pheasant is a native of Mingrelia in Asia Minor, where, during the Crimean war, our countrymen found it, as no doubt did the Argonauts some three thousand years ago. It was introduced into Greece, it is supposed, five hundred years before the birth of Christ, and from the Greeks the Romans received it, and spread it over the civilized and temperate parts of western Europe. In our own country, the pheasant is traced back to the reign of our first Edward or to the middle of the thirteenth century, and no doubt was brought from France by the Normans. At the end of that century it must have been already tolerably common, for in a tariff of poultry established for London in 1299, and quoted by Bishop Fleetwood in his *Chronicon Preciosum*, the pheasant is valued at fourpence, the same as a goose, and four times the price of a "fat cock." The pheasant is chiefly valued for sport, for its flesh is but a shade better than that of a pullet, and greatly inferior to that of any of our native game birds.

The Greeks gave the pheasant the name of *taturas*, a word the origin of which is, I believe, unknown, but they also called it the Phasian bird, after the Phasis, a river of the ancient Colchis, near which, it may be presumed, they first found it. From this the Romans named it *phasianus*, and this word, with various corruptions, has been adopted in all the modern languages of Europe, as *fagiano* in Italian, *faisan* in French and Spanish, *fasan* in German, and *pheasant* in our own tongue.

The Peacock.—Independent of seven species of the small but beautiful bird called popularly the double-spurred peacock, but by naturalists the *polypleetron*, there are two species of the large peacock. One of these is a native of the tropical and subtropical parts of Hindustan, and the other of the tropical countries lying between India and China,—of the Malayan peninsula, and of the islands of Sumatra and Java. It may be remarked that neither of them is to be found in Borneo, in Celebes, or in any of the Philippines so near to the Malayan peninsula and Sumatra.

Both species are of nearly equal size and beauty, and are incomparably the most gorgeous of the whole feathered creation. The first-named of these, the native Hindustan, is that which has been so long naturalized in Europe. The precise time of the introduction of the peacock into Greece is unknown, but it certainly preceded that of Alexander, ascribed to it by Buffon and Cuvier, for the bird is mentioned, which I state on the authority of Mr. Twistleton, in "The Birds" of Aristophanes, which is supposed to have been first acted 414 years before Christ, or 88 years before Alexander's Indian expedition. It must have been known, however, much earlier, for it was dedicated to Juno, as was the eagle to Jupiter, and therefore was engrafted on the mythology of Greece, an affair of antiquity in the days of Alexander and of Aristophanes.

Persia, which lay between Greece and India, and which had conquests in both countries, was the link which connected these countries, so remote from each other ; and through Persia, therefore, it is natural to believe that the peacock would be first introduced into Greece. This is, indeed, corroborated by our finding the Greek and Persian name of the bird the same—namely, *taos* or *täus*. The peacock is nowhere found represented on any of the ancient monuments of Assyria, Syria, or Egypt. On the first of these, where the elephant is so faithfully depicted, it might have been expected. The Egyptians, had they been acquainted with so striking an object, would hardly have failed to have represented it on their monuments, and, from their ignorance of it, it is to be inferred that their less civilized neighbours, the Jews, once their bondsmen, were equally unacquainted with it. From this it will probably be considered a legitimate conclusion that the peacocks of our translation of the Bible, represented as having been brought, along with apes, ivory, and gold, by the fleets of Solomon, from Ophir, must have been some other birds, and I would suggest the hardy parrot as far more likely to have been brought from a remote country than the bulky and delicate peacock. Parrots, apes, ivory, and gold might all have been got in parts of Africa, far more accessible to the ships of Solomon than remote India.

The Greek and Persian name for the peacock cannot be traced to any Indian name. The Sanskrit has, besides epithets, no fewer than four specific names for it, *keki*, *barhi*, *sarang*, and *manyura*, the last, in the corrupted form of *mur*, or *mhur*, being the usual one in the languages of Northern India derived from Sanskrit. In the languages of Southern India we find names for it wholly different. Thus, in the Tamil, it is *mayil*, and in the Telugu and Canara, *nemale*. In Malay and Javanese the name is *mârak*, while in the last of these tongues we have, in the polite dialect, the Sankrit name *manyura*, written *manura*. The peacock is a native of all the countries in which the names enumerated prevail. The origin of the Persian name, borrowed by the Arabs, is, I believe, unknown. So, I presume, is the Latin one, *pavo*, from which comes the name of the bird in all the languages of Europe, as in Italian, *pavone ;* in Spanish, *pavon ;* in French, *paon ;* in German, *pfau ;* and in our own, *pea*.

The domestic peacock sports little in plumage, the varieties from the original being only to white and spotted, and not at all as to size or form, for in these respects it does not differ from the wild bird of the Indian forests. It is very easily domesticated, but its domestication, to the extent to which it is carried by the European nations, is unknown to the Indians. By the Hindus it is preserved in groves near temples and villages, as we preserve pheasants, with this very material difference, that they are never shot. Even this amount of domestication is not practised with the extra-Indian species.

A notion has prevailed among Europeans that the peacock is an object of worship with the Hindus ; and surely it would be more worthy of being so than snakes and monkeys, which sometimes are so, but there is no foundation for this allegation. An English officer, who was a better soldier than an oriental scholar, commanded, under the administration of Warren Hastings, the first British detachment that entered the country of the Rajpoots, in which he had imagined that peacock-worship was peculiarly prevalent. In this belief, and resolved to give no offence to the religious prejudices of the people, he is said to have issued the following general order to his troops: "Peacocks being the gods of this country, no one to shoot them on any account whatsoever."

The flesh of the full-grown peafowl, whether male or female, is tough and sapless, of little value as food, but that of the young bird sapid, tender, and well-flavoured, equal, indeed, to that of a turkey poult. India, then, when it gave us the peacock, by no means conferred upon us an equal benefit, as did America when it gave us the turkey.

The Turkey.—There are three wild species of this genus of gallinaceous birds, which naturalists have called *meleagris*, although with the Romans that is the name of the *gallini*, or Guinea-fowl. These species are—the *Mexicana* and the *occidentalis*, or turkey of the Southern States of the American Union, and the *ocellata* or Honduras turkey. The first of these only has been domesticated, a fact first ascertained by my friend Mr. Gould, for, before his time, the second was considered to be the source of the domestic bird.

The turkeys are exclusively natives of the New World, and the genial habitat of the species which has been domesticated is the plateau of the Cordillera of the Andes, some ten thousand feet above the sea. The climate of this region is probably the most favourable to it, and consequently that in which it is most easily reared. It thrives, however, perfectly well in climates very different from it, as in that of France and England, of Bengal, and of Java, over a range of at least 60 degrees of latitude.

Cortes and his companions found the turkey domesticated in Mexico when they conquered it in 1520. It was the only domestic animal which the Mexicans possessed, for they had not, like the Peruvians and Chilians, tamed the llama and paco. Soon after the conquest of Mexico it must have been brought to Spain and Italy, for in the pictures of Giacomo Bassano, representing the entrance into and issue from the Ark, the turkey is represented in all the variety of plumage which characterizes the domestic bird. That artist was born in 1510, and died in 1592. If we suppose him to have painted the pictures referred to at forty, the turkey must have been a familiar bird to the Italians within thirty years of the conquest of Mexico.

Some eighty years ago Pennant found it worth while to write an elaborate and learned paper in the *Philosophical Transactions*, to prove that the naturalists who had gone before him were wrong in ascribing the turkey to Africa or India, and that it was really a native of America. In the course of his dissertation he shows that it was already tolerably common in England in 1585, or sixty-five years after the conquest of Mexico. Its first appearance in France, he shows, was at the nuptial feast of Charles IX in 1570. It was certainly familiar enough in England in the time of Shakespeare, for in several passages he alludes to it. Thus, in *Twelfth Night*, Fabian says of Malvoglio, "Contemplation makes a rare turkey cock of him. See how he jets (struts) under his advanced plumes;" and again, in *Henry V*, Fluellin says of Ancient Pistol, "Here he comes, swelling like a turkey cock." This would take us back to the last years of the sixteenth or first of the seventeenth century, When, however, Shakespeare, in the first part of *Henry IV*, makes a carrier complain that the "turkeys in his panniers are quite starved," owing to the high price of oats, he is guilty of an anachronism, since the time of the action of the play was 113 years before the conquest of Mexico.

The whole history of the turkey is European, for the Mexicans had not disseminated it among any of the other American nations, and it is comprehended within the brief period of 340 years. As an article of food it is unknown to the people of Africa and Asia, even to the omnivorous Chinese; while the nations who have adopted the Mohammedan religion reject it on the whimsical ground that the tuft of hair on its breast bears some resemblance to the bristles of that, to them, obscene and forbidden animal, the hog.

The names given by European nations to the turkey do not point very clearly in any case to its origin. The Spaniards, who became first acquainted with it, called it by the Latin name of the peacock, *pavo*, adding the epithet "real," or true, to distinguish the latter bird. The Italian and French names make reference to India, which, however, may be either the East or the West Indies, but our own is the most preposterous of all, for we derive it from a country in which it did not exist either in the wild or domestic state, and where, indeed, it is but little known at the present day. In Persia it seems scarcely to be known at all. While one of the missions of the late Sir John Malcolm was at the Persian court an account was brought to it of a wonderful and strange bird, which was to be seen about twenty miles from Tehran. Some of the gentlemen of Sir John's suite, solicitous for the extension of natural history, rode to the spot in hot haste, and found a turkey cock!

The turkey is, no doubt, a valuable gift, conferred on us by America; but still, being only a luxury of the rich, it is not for a moment to be compared in utility to the common fowl, the gift of India. It is one of the five great gifts, but the least of them, which the New has conferred on the Old World, the other four being—the potato, maize, the cinchona or Peruvian bark, and tobacco. For value the Peruvian bark is, I presume, the first, as being at the head of the long catalogue of the *materia medica.*

The potato for a long time, and now maize, contribute largely to the sustenance of the whole population of our own islands, while they form the main food of the people of one of them. Tobacco we find to be a very convenient machine by which we levy a kind of voluntary poll-tax, which puts six millions sterling into the Imperial treasury.

*The Pigeon.**—The pigeons consist of a vast number of species, varying in size from that of the thrush up to that of the magnificent crown pigion of New Guinea, which equals in size the capercailzie, or wood-grouse. In colour they are of many hues —blue, brown, white, dun, and green; the last of these colours being the prevailing one in tropical and sub-tropical countries. They belong to every quarter of the globe. Some are denizens of the woods, some of the open plains, some of the rocks, and some of the seashore.

Of this almost countless number one species only, and that among the wildest, has been domesticated. This is the blue rock-pigeon, the *Columba livida* of naturalists. This bird exists still in the wild state, in all the temperate and sub-tropical regions of Europe, Asia, and Africa, but I believe not of America. It would seem to be the sole source of the almost infinite variety in form and colour of the domesticated varieties, all of which will pair among themselves to the production of a fruitful offspring, partaking of the characters of both parents.

The pigeon, wild or domestic, is not represented on any Egyptian monument. A dove, or pigeon, however, is to be seen on Assyrian, Lycian, and Etruscan monuments; but in the absence of colour it is impossible to say whether wild or tame, both being commonly of the same size and form. Neither is the pigeon represented on any Hindu monument; and, indeed, this bird seems never to have had a place in the mythology of the Hindus. Birds of the pigeon family, translated by us "pigeons and turtle-doves," were early used by the Jews for food and sacrifice, but whether wild or domestic is not stated in the Scriptures. It seems most likely that they were wild, and the mere produce of the fowler's art, but fed and kept after capture until wanted, as was found to be done in some of the Polynesian Islands, when first discovered. By the Levitical law pigeons were, indeed, the only birds that were lawful food, and, as sacrifice, they were the cheap substitutes of the sheep and goat. This view is corroborated by the pigeon being named along with doves, which are not amenable to domestication. The Greeks and Romans were early in possession of the domestic pigeon, using it for food, and also for the transmission of messages; but when or by whom it was first domesticated among them is wholly unknown. The Arabs and Persians have been immemorially acquainted with the domestic pigeon, and with them, as with the Jews, its flesh is lawful food. The finest, indeed, are said to be bred in the mosques of Alexandria and Cairo. It is not, however, an improbable hypothesis that Egyptians, Persians, and Arabians may have acquired the tame pigeon from Greece and Rome.

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* Turkish, *giugerchean.*

It is probable that the domestic pigeon may have been introduced into Hindustan from Persia, and from thence spread to the Hindu-Chinese countries; for I have myself seen it in the half-domesticated state, in great plenty, in the temples of Burmah and Siam, down to the thirteenth degree of latitude,

Some light is thrown on the history of the domestic pigeon through the names by which it is known in the languages of the nations who possess it. In this inquiry, however, we encounter some perplexity, owing to the number of wild species of the genus which everywhere exist, and the consequent difficulty of assigning its proper name to the domesticated bird. Thus, in Greek there are five names, in French and English three each, and in the Malay language there are no fewer than ten, being those of as many distinct species.

In Sanskrit the name of the common blue pigeon is *kapota,* in Hindi *parara,* and in the Tamil *pura*—three different names in as many Indian languages, yet none of these in common use, the current name being Persian. The blue pigeon, in a half-wild state, without in any way differing in plumage from the wild bird of Europe, except in the possession, according to my friend Charles Darwin, of a black bar across the tail feathers, is abundant in many parts of India. It breeds in the deep wells of the country, which have inside a casing of uncemented rough stones, allowing the birds to form their nests in the interstices. The usual name by which it is known in Upper India, as above stated, is Persian, *kabutar,* which leads to a suspicion that the bird, as thus described, was introduced by the Northern conquerors. The *kabutar* of the Persian may, however, be essentially the same word with the *kapota* of the Sanskrit, for the two languages have many words in common, easily detected, without recourse to the literal legerdemain practised on the European languages. The Arabic name for the wild bird is *hámam,* and for the domestic *yámam.* The Greek name which is supposed to refer to it is believed to be *peristera,* the Latin is *columbus,* and the German *daube,* the source of our own "dove." The Italian *colombo,* the Spanish *palomo,* and the Portuguese *pombo,* are all obvious corruptions of the Latin word. So is the Erse or Irish name, variously written *columan, calman, colman, colm,* and *colum,* from which it may be inferred that the domestic pigeon, before unknown to the Britons, was introduced by the Romans or by the foreign Christian priesthood.

The origin of the word pigeon, which we have taken from the Normans, and substituted for the Saxon " dove," still preserved in the compound words dove-cot and dove-house, for a pigeon-house, is, I believe, unknown. Some French etymologists have traced it to the Latin verb *pipire*, to pipe or chirp, which seems very unlikely indeed.

In the Malay and Javanese languages the name given to the rock-pigeon, wild and domestic, is *dara*, while the name of the family of pigeons is *márpati*, or changing one labial for another, *párpati.* Each species has a distinct name, and in framing a Malay dictionary I had to enumerate ten of them. It is the generic Malay name that is applied by the Philippine islanders to the domestic pigeon, with such corruptions as the following—*palapati*, *calapati*, and *salampati.*

The Goose.—In the wild state, the number of species of the goose is very great. Nearly the whole family consists of birds of passage. It belongs to temperate, and still more to cold regions extending north as far as the Arctic Circle, but never seen, I believe, within the fifteenth degree from the Equator. In the winter geese are as numerous in Northern Hindustan, as they are in spring on the shores of Hudson's Bay. The family belongs equally to Europe, Asia, Africa, and America, but is unknown in Australia.

Two of the wild species have been domesticated in Europe, the grey lag, *anas anser*, and the bean goose, *anas segetum*, the first being the source of our own domestic bird, and the last of that of some countries of Southern Europe. The domestic goose of China had evidently a distinct source from these. The domestication of the goose is of very great antiquity, for the bird is frequently represented on the most ancient monuments of Egypt, and is probably of equal antiquity in China. It is not seen, however, on any Assyrian, Lycian, or even Hindo monument. In the domestic state, indeed, even now, the goose is of rare occurrence in all the countries between China and Egypt, and the probability is that the nations of Central and Western Asia had never domesticated it at all. No American nation had ever done so, although all the extra tropical parts of that continent are frequented by species apparently capable of domestication; and the same observation applies to the negro nations of Africa.

As to the nations of Europe to whom alone, the Chinese excepted, the goose is a frequent and familiar domestic bird, we find mention made of it in the Homeric poems; and the Roman legend which describes the Capitol to have been saved by its watchfulness, shows that it was familiar in Italy, in the domestic state, 390 years before the birth of Christ. It is one of the domestic animals named by Cæsar as being possessed by the Britons, and we thence infer that our forefathers were acquainted with it 2,000 years ago, although making little use of it.

The name of the goose is one of the class of words which some learned men have adduced as evidence to prove that the ancient and modern languages of Europe are essentially the same with the dead Sanskrit of India; and hence, although the inference does not seem very obvious or very natural, that the nations who spoke, or now speak them are of one and the same race of man, both having proceeded, at a time far beyond the reach of history, from a mythical country of Central Asia, called Aryana. I shall briefly examine this hypothesis, in so far as the name given to the goose is supposed to afford evidence of it.

The name for the goose in Sanskrit is *hansa*, but it is not that of the goose alone, for it is equally that of the duck; indeed, it is alleged, even of the swan. To distinguish the goose, the epithet *raj*, or *raja*, king, has to be prefixed. It is the same in the Persian language, in which the word *bát* equally expresses the duck and the goose; and so it is in the languages of Southern India, as in the Tamil, where the word is *vatu*, bearing no resemblance to the Sanskrit one. The words which the hypothesis supposes to have been derived from the Sanskrit *hansa* are, the Persian *bát*, the Greek *chen* or *chan*, the Latin *anser*, the Scandinavian *gaas*, the Gaelic *geadh*, and the English *goose*. I can put no faith in the cunning alchymy that would assimilate such apparently heterogeneous and incongruous sounds. It appears to me that in the languages of people to whom the goose and duck are equally familiar, there will be found a specific name for each, while in those of nations among whom the former is a bird of rare occurrence, the two birds have a common name, taken from that of the most familiar of them, always the duck. Had the theory any foundation the same word would have equally expressed the duck and goose in the supposed derivative languages, as it does in the supposed parent tongue, the Sanskrit. This view seems to be corroborated by the names of the two birds in the Malay and Javanese languages, in which we find native names (disseminated from them over the other languages of the Malayan and Philippine Archipelagos) for the domestic duck, while the Sanskrit one, with the change only of one nasal for another, is confined to the rare and hardly yet naturalized goose.

The names given to the goose in the modern languages of

Europe have distinct sources,—now Latin, now Teutonic, and now Arabic; and, as far as I can judge, not one of them traceable to Sanskrit. The Italian *oca* and the French *oie* come from the middle-age Latin *auca.* The Spanish has four names for the goose—*anser* from classic, *oia* from barbarous Latin, *gansa* and *pato* from the Teutonic. The Portuguese has two names—*ganso* from the Teutonic, and *pato* from the Arabic. This last word is obviously the *bât* of the Arabic and Persian, one labial being exchanged for another, and a vowel added for euphony; and it is remarkable that in Spanish, as in Arabic and Persian, the term is applied equally to the duck as to the goose.

As to the names of Teutonic origin, the whole of them seem to be essentially one and the same—the *gaas* of the Scandinavian, the *gans* of the German, the goose of the English, and the *ganso* of the Spanish and Portuguese, the words in the southern tongues being only softened in sound, and lengthened from monosyllables to bisyllables. It is curious to find our ingenious etymologists, on discovering that the English word *goose* bore no very apparent resemblance to the Sanskrit *hansa,* having had recourse to the name of the male bird, gander, because (and I can discover no better reason) two out of its five letters are the same as those of the Sanskrit name. In the names of all the domesticated animals the males and female have, in the Teutonic tongues, distinct names, as in our own—the cock and hen, duck and drake, ewe and ram, bull and cow, horse and mare, the most used of the two being applied generically. It is the same in the Celtic tongues; and indeed, for the most part, in the Latin and its derivatives; while in the Eastern languages the sexes are distinguished either by an inflexion or an epithet. If the male of the goose is to be traced to the Sanskrit, so ought all the males of other animals, and the hopeless task of showing that such is the case is one that no one has yet ventured to undertake.

In the Malayan languages the Sanskrit name for the goose, the original word *hansa* undergoing no other change than into *hangsa,* the mere change of one nasal for another, but the word is never applied to the duck, which has native names. But besides the Sanskrit name for the goose the Portuguese introduced their own *gansa,* which the Malays, by a similar alteration to that which they have made in the Sanskrit word, pronounce *gangsa.* In compiling a Malay dictionary I had fancied that the Portuguese word was a mere corruption of the Sanskrit one, and so marked it, but I am now satisfied that its origin is the same as that of the English word *goose.* In so far, then, as the goose is concerned, the Aryan hypothesis seems to me to be grounded on no better foundation than the approximation in sound to the Sanskrit *hansa* and the Latin *anser,* while the names in the other supposed derivative languages, so utterly dissonant, are but forced into some similitude. Had there been any foundation for the hypothesis it would have been the duck, but, above all, the common fowl an admitted native of India, and not the goose that would have borne names in the Western languages traceable to the Sanskrit, yet no one pretends that such is the case.

The goose has been to man of far less value than the domestic fowl—perhaps even than the duck, for it is more difficult to rear, and its flesh inferior in quality. It has, however, its own special utility in its quills and its down. The Eastern nations since the discovery of papyrus and paper, have always written, some with a pencil as the Chinese, and some with a reed as the Arabs and Persians, but the nations of the West ever with the quills of a goose's wing. Without this flexible instrument, Virgil could not conveniently have written the *Æneid*, nor Shakspear *Hamlet* or *Macbeth.* Notwithstanding the large use at present of metallic pens, we are still great consumers of goose-quills, and some notion, although an inadequate one, may be formed by the amount of our own importation of them, which is not less than twelve millions and a half—yet not a quill a year for every two of us, man, woman, and child.

The Duck.—Of the almost innumerable species of this family but a small number has been found amenable to domestication. The most notable is the mallard, the *anas boschas* of naturalists, or common wild duck, which is the principal if not the sole source of the domestic duck of Europe. The family is numerous, extending from the Arctic and Antarctic Circles to within about ten degrees of the Equator, when it becomes rare. In the Malayan islands, for example, there exists but one small teal, the *anas arcuata.* In the Philippines, wild ducks of several species are numerous, and in Lower Bengal they are very abundant, most of them birds of passage.

The duck, in the domestic state, is at present very widely spread over the world—probably fully as much so as the domestic fowl. In some countries, as in China, the Hindu-Chinese countries and the Indian islands, it is much more so. It was wholly unknown throughout the entire continent of America when discovered, although in some of the northern parts of it the mallard, the source of the European domestic duck, is known as a bird of passage, from which it is to be concluded that the mere existence of an animal amenable to domestication is not enough. The people among whom animals amenable to domestication exist, must also possess the intelligence and patience necessary to effect its domestication, and this, with the exception of the Mexicans, in the case of the turkey, dog, and the Peruvians in the cases of the llamas, no American nation had ever possessed. In the northern parts of that continent, it is probable that the great abundance of wild animals and the fewness of human inhabitants, would be a discouragement to their domestication.

The duck in the domestic state was as much a stranger in the islands of the Pacific Ocean as in America, although the domestic fowl was known to several of the tribes inhabiting them. To these, to America and to Australia, it has been conveyed by the nations of Europe, and in all of them, whatever the climate, it has, with its habitual hardihood, fecundity and usefulness, invariably thriven and multiplied. It was the Malays, as shewn by the name of the bird, *itik,* who introduced the duck into the Philippines, and the extent to which it has thriven may be seen by the account which Sir John Bowring gives of the manner in which it is there bred. "Tuig," says he, in his recent work on the Philippines, "is a pretty village with thermal baths and about four thousand inhabitants; its fish is said to be particularly fine. Near it is the village of Pateras, which, no doubt, takes its name from the enormous quantity of artificially hatched ducks *(patos),* which are bred there, and which are seen in incredible numbers on the banks of the river. They are fed by small shell-fish found abundantly in the neighbouring lake, and which are brought in boats to the Paterias on the banks of the river. This duck-rearing is called itig (Malay, *itik,* a duck) by the Indians. Each pateria is separated from its neighbour by a bamboo enclosure on the river, and at sunset the ducks withdraw from the water to adjacent buildings, where they deposit their eggs during the night, and in the morning return in long procession to the river. The eggs being collected, are placed in large receptacles containing warm rice-husks, which are kept at the same temperature, the whole is covered with cloth, and the young birds are removed by their owners as fast as they are hatched. We saw hundreds of the ducklings running about in shallow bamboo baskets, waiting to be transferred to the banks of the river."

The wild source of the domestic duck of China, Cochin-China, and Java, is most probably a different species from the mallard, that of Europe. This is to be inferred from its sporting very little in colour, which is invariably a dusky brown, never assuming the colours of the mallard, as does the European duck,—from its walking erect in the manner of a penguin, and from its flesh being of a very inferior quality.

In Southern China, Tonquin, and Cochin-China, ducks form, after pork, the chief animal food of the people, and they do so in the Malayan islands after the buffalo. They are dried and smoked as we do the flesh of the hog, and their salted eggs make a large share of sea-stock.

The duck, in the domestic state, seems to have been unknown to the Egyptians, to the Greeks in the Homeric times, and to the Jews of the time of the Old Testament. Cæsar does not enumerate it among the domestic animals of the Britons, and we conclude, therefore, that it was unknown to our ancestors some two thousand years ago. That it was known in Italy for several centuries before the Christian era is certain, for we find itself and the goose very frequently represented on Etruscan vases. When or by whom the duck was first domesticated is unknown, and unknowable, but to judge by the variety which now exists, the useful discovery was probably made at several distant and independent points, and India and China would probably be among the foremost, as earliest in civilization. That its first domestication is an affair of very remote times is, I think, to be inferred from the fact that the wild mallard, although easily tamed, has not been found to sport, in form or colour, or to lose the power of flight, in any length of time that the experiment has been tried.

That the art of domesticating the duck was discovered at several distant and independent points is, I think, further to be inferred from the different and independent names given to it in the languages of several nations. The names, *hansa* in Sanskrit, *vuttu* in Tamil, and *bât* in Persian, now given in common to the duck and goose, were, I have no doubt, originally those of the duck only, and extended afterwards with an epithet to the goose, a less important and more recent conquest. In the languages of Eastern people among whom the duck has been immemorially domesticated, while the goose is professedly but of comparatively recent introduction, and, still, little better than naturalized, there is always a specific name for the duck. Thus, in Malay it is *itik*, and in Javanese *bebek*, the goose, as already stated, going under the Sanskrit name of *hangsa,* with the Portuguese synonyme of *gangsa.* The Malay name, I may notice, has been very widely disseminated, for it is to be found in nearly all the languages east of Sumatra, as far as the Philippines, in which last it presents itself, but having for a synonyme the Spanish *pato,* corrupted from the Arabic.

In the languages of European nations the duck and goose have always distinct names, and those for the former seem to be different in each class of tongues. Thus we have in the Greek *caschas,* in Latin *anas,* in German *ente*, and in Erse *tunnag.* The *anitra* of the Italian and the *anade* of the Spanish are corruptions of the Latin *anas,* taken from one of its oblique cases. The Portuguese *adem* may possibly be a still greater corruption of the same word. The origin of the English word *duck* and the French *canard* have not, I believe, been traced.

The Swan.—The swan, far more ornamental than useful, can hardly be named among domesticated birds. All the species (and there are six of them) seem amenable to a certain amount of domestication, but that which has been long familiar to us is one species only, the *cygnus musicus* of the ancients. The white swans are natives of the colder regions of Europe, Asia, and America, visiting the more temperate in winter. The black swan, a creature of the imagination with the ancients, is confined to the southern parts of the continent of Australia.

The Sanskrit has no name for the swan, naturally enough, since the bird never visits even the most northerly parts of Hindustan. In the languages of the countries in which the bird is known it has distinct names. In Persian it is *chuhcah*, in Greek *kukras*, in Latin *cygnus*, in German *schwan*, and in Erse, or Irish, *aila*. The Italian *cigno*, the French *cigne*, and the Spanish *cisne*, are corruptions of the Latin name; our own a corruption of the German, or rather another orthography of the same word. Assuredly this diversity would not have existed had all the languages of Europe been derived from a common source, and that source the country of Transaxiana, the Aryana of Sanskrit scholars. The flesh of the swan, even of the *cygnet*, is of very little value, but its down is valuable, and the quills, I find, are valued at sixfold those of the goose.

I may conclude with a few general remarks. 1. Amidst the vast multitude of the feathered creation, the number amenable to domestication, or, at all events, which has been domesticated, is extremely small. 2. Within the historic period not one species has been domesticated, the domestication of all of them belonging to times too rude and remote for record. To this the only exception that I am aware of is the musk-duck, a native of Equatorial America, of no great value. 3. Differing in this respect from the greater number of domesticated quadrupeds, all our domesticated or half-domesticated birds are traceable to their originals in the wild state, a fact, no doubt, ascribable to their superior means of escaping pursuit through their power of flight. 4. The domesticated are invariably larger than their wild originals. 5. The variety as to plumage, form, and size, differs in the different species, and is usually proportioned to the extent of domestication of which they are capable, and generally to their utility to man. The variety is greatest in the common fowl, the turkey, and duck, less in the goose, but carried so far in all of them, that they lose the power of flight. The least useful to man differ little in plumage, and not at all in size, from the wild birds from which they sprang, while they all preserve, to a greater or less degree, the power of flight, as in the examples of the gallini and the peacock. The pigeon sports, indeed, infinitely as to colours and form, but in magnitude it does not exceed the wild bird, and it preserves its power of flight entire. The pheasants have been only naturalized, not domesticated, and do not sport at all, or if they occasionally do so, perhaps not more frequently than in the absolutely wild state. 6. The number of the different species domesticated in possession of different nations will be found proportioned to the extent of their civilization. Savages have none at all. The wild inhabitants of Borneo have but one, the common fowl. The Egyptians had but one, the goose. The early Greeks had but the duck and goose. The Chinese have only the common fowl, the duck, and goose. The Hindus, the Malays, and the Persians, in common use, only the common fowl and duck. It is the more civilized nations of modern Europe alone that possess the whole number. 7. The domesticated birds are very far from having proved of equal utility to man with the domesticated quadrupeds. Their strength is nothing, their tegument of small comparative value, and their flesh more or less a luxury viewing the comparative cost of rearing them.

DOMESTICATED INSECTS.

There are but four insects that have been domesticated—the silk-worm, the bee, the cochineal and the lac insects; but the presence or absence of one or other of them certainly indicate stages in the progress of civilization.

The Silk-worm.—By far the most important of these is the silk-worm. In Tropical Hindustan and China, as well as in the countries which lie between them, wild silk-worms exist in the forests, the coarse produce of which is still used for textile purposes. All that seems to have been necessary was to place these under the care of man, and to cultivate for them the most suitable food. It seems generally allowed that this discovery was first made by the Chinese, and that from them it spread eastward to Japan, and westward as far as Spain. No insect producing a cocoon or nest available for economic use is known in Europe, Western Asia, or the New World.

When or in what manner the cultivated silk-worm was introduced into Japan, Anam, Persia, and India, we know not, for the incurious and inaccurate nations of these countries keep no records of such events. But as far as India is concerned, as the Greeks of the times of Alexander and his successors, who were in direct communication with it, make no mention of silk as one of its productions, not even the art of winding the filament of the wild cocoon, it may be concluded that in their time silk was as yet unknown to the Hindus. The rearing of the silk-worm with the manufacture of silk in Europe was first introduced in the reign of the Emperor Justinian. The manner in which the silk insect was introduced is told by the historian Procopius, and fully credited by Gibbon and Robertson. Two Christian monks, Persians by birth, had resided in China, and there observed the art of rearing the silk-worm. They reported the matter to the Emperor, and, by his command, returned to China, and succeeded in carrying back the eggs in a hollow cane. These were hatched, and the worms fed on mulberry leaves, and from the contents of this hollow cane have sprung all the silk of Turkey, of Italy, of France, of Spain, and, most probably, also of Persia. By some such obvious and, indeed, only possible means, silk must have been introduced, but the story has still a somewhat monkish aspect, for the names of the adventurous monks are not stated, nor any specific date given for their beneficent enterprise out of the thirty-eight years that Justinian reigned.

The quality of the silk produced may be accepted as a fair test of the civilization of the nations producing it, due allowance being made for climate, which may generally be described as that which is most favourable to the vine. The finest silk is produced in Italy and France, although in these the worm be an exotic. Next to these is China, the parent country of the worm. Bengal stands much below China, notwithstanding the advantage of much European improvement. Three thousand French or Italian cocoons or larvæ-nests will yield sixteen pounds of raw silk, while it will take fourteen thousand of the cocoons of Bengal to yield the same quantity of an inferior article. The silk of Japan, of which a considerable quantity is now exported, is inferior to that of China, but on a level with that of Bengal, and, but for European improvement in the last, would be much superior to it. The lowest silks are those of Cochin-China, Siam, Persia, and Turkey, corresponding with the low industrial skill and inferior civilization of the nations inhabiting these countries.

Some notion of the importance of the produce of the Chinese butterfly, which Greek or Roman never saw, and of the bare existence of which, indeed, they had no conception until above five centuries after the birth of Christ, may be formed from the statement of a few facts. We ourselves import raw and wrought silks, to the yearly value of fifteen millions. The very ribbons we import are of a value little short of a million and a half. The silks of France are probably of still greater value, and those of China are most likely worth both of them put together. In the third century a pound of Chinese silk was worth in Rome twelve ounces of gold. A pound of silk of the same country sells now in London for about one-fiftieth part of that price; and the gown of the wife of an industrious mechanic, made from it, is of a quality far superior to the robe of a Roman empress, made of the same material.

The Bee.—The domestic bee, although varying in form and size, like other animals long domesticated, is considered to be everywhere the same species, one out of many of the same genus. Its domestication marks a stage in the progress of civilization, but still a very early one. Among mere savages it is unknown, for to these the produce of wild bees is sufficient, in the same way that the wild animals are sufficient for the mere hunter. Among the more advanced nations of temperate Europe and Asia, the domestication of the bee is probably as old as that of the ox or the hog. It is now, and immemorially has been, practised by all the nations of Europe, by the Egyptians, and the Persians.

There are, however, some remarkable exceptions. The bee was not domesticated by the Jews of Scripture; to be accounted for, in some degree, by their barbarism, and, perhaps, in a good measure, from Palestine being a region peculiarly favourable to the bee in its wild state,—a land, in the figurative language of Scripture, "overflowing with honey." The bee has been domesticated in the cold region within the ranges of the Himalaya, but in no part of the plain of Hindustan. Its absence is, it may be presumed, to be accounted for by the early culture of the sugar-cane to the north, and the presence of palms to the south, the saps of which yield a far more cheap and abundant saccharime matter than the honeycomb. Neither has the bee been domesticated in any part of China or any part of Africa, Egypt excepted, probably for the same reason. In tropical countries, where flowers are to be found at all seasons of the year, the bee has no motive for laying in a store of honey for any other purpose than that of feeding the young; and hence the domestication of the bee is unknown to them. This, however, does not preclude particular localities specially favourable to bees from being claimed as private property, of which we have examples in the customary laws of the Malays.

The civilized nations of ancient and middle-age Europe had no other saccharine matter than honey, so that to them the cultivation of the bee was a matter of much importance; and here, I cannot help observing that it is singular that people who had invented the far more difficult arts of fabricating malleable iron, and of reducing the ores of copper and silver, should not have discovered the seemingly far easier art of extracting and crystalizing the saccharine matter of such plants as the beet and carrot, which were well known to them.

Honey, of such value and importance to our ancestors, is with us, who consume yearly not less than 800,000 tons of the produce of the cane, reduced to the rank of a mere sweetmeat. The wax is of far more consequence, for we import it yearly to the amount of some 600 tons, and most of it the produce of wild bees, to judge by the countries from which we receive it, such as India, Africa, and Brazil.

Cochineal.—The cochineal insect, the *coccus cacti* of naturalists, is the exclusive product of the New World, within the tropics. It is the sole source of true scarlet, a colour unknown to antiquity, to the middle ages, and even to Hindus and Chinese. The Roman purple was of the colour of blood, and had a strong smell, so that there can be no doubt but that the box-coat of one of Queen Victoria's coachmen is an article of far superior value to the Imperial robe of Augustus Cæsar, which, besides its inferior colour, and unpleasant odour, was made of vulgar serge. Although now our own national colour, it has become so only in comparatively modern times. The warriors of Agincourt and Cressy—even those of Bosworth-field, were certainly not clothed in scarlet, for the cochineal insect was unknown to Europe until Cortez conquered Mexico, in the first quarter of the sixteenth century. Of this little insect, smaller than a pepper-corn, we use yearly to the value of £400,000.

Lac Insect.—This minute creature, the *coccus ficus* of naturalists, a native of Tropical Asia, from Bengal to Siam inclusive, is described by Buchanan Hamilton as being domesticated in the first of these countries. The insect itself, which forms its nidus round the twigs of trees, mostly of the fig family, is itself the source of the colouring matter, a red much inferior in quality to that of the cochineal. Some half century ago the art of preparing a soluble dye from the lac and its gum, was discovered by some Englishmen, in Bengal, and under the name of lac-dye this article is now used as a cheap substitute for cochineal, in the production of an inferior scarlet. We import it ourselves to the extent of some 8,000 cwts. But the gum or resin, which forms the nest of the insect, is now of more value than the dye, being an indispensable ingredient of sealing-wax, and a valuable material for varnishes. Of this we import yearly to the amount of better than 16,000 cwts., of the value of £170,000.

The word "lac," which has long had its place in our dictionaries, I may mention, is derived from the Sanskrit word *laksha*, vernacularly *lac*, or *lak*, the numeral for "a hundred thousand," in reference to the great number of the insects in a single nest.

I make this statement on the high authority of the greatest oriental scholar of his day, my friend the late Horace Wilson.

The value of the insect produce which we consume yearly will not be over-rated at sixteen millions; so that the domestication of insects is more connected with the progress of civilization than might at first sight appear.

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